

RCRA FACILITY ASSESSMENT

**EVERGREEN OIL INC.
6880 SMITH AVENUE
NEWARK, CALIFORNIA
EPA I.D. No. CAD 980887418**

Prepared for:

**United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105-3901**

Prepared by:

Mike Eshaghian

**State Of California
Department of Toxic Substances Control
Southern California Permitting and Corrective Action Branch
1011 North Grandview Avenue
Glendale, California 91201**

May 2004

TABLE OF CONTENTS

1.0. INTRODUCTION	1
1.1 Purpose.....	1
1.2 General Procedures used for Information Gathering	2
1.3 Facility Name, US EPA I.D., Dates of Completion of PR, VSI, SV	2
2.0. SITE DESCRIPTION	3
2.1 Site Location	3
2.2 Owner/Operator History	3
2.3 Facility Processes and Waste Management.....	4
2.3.1. Current Facility Processes and Waste Management.....	4
2.3.2. Proposed Facility Processes and Waste Management.....	5
3.0. REGULATORY INVOLVEMENT AND EVERGREEN ACTIONS	17
3.1 U.S. Environmental Protection Agency, State, and Local Permit Status	17
3.1.1 U.S. Environmental Protection Agency	17
3.1.2 City of Newark.....	17
3.1.3 City of Newark Fire Department.....	18
3.1.4 Bay Area Air Quality Management District (BAAQMD)	18
3.1.5 State Water Resources Board and California Regional Water Quality Control Board, San Francisco Bay Region.....	19
3.1.6 Department of Toxic Substances Control (DTSC) -	19
3.1.7 Union Sanitation District (USD) -.....	20

3.2	Evergreen Actions and Modification Projects for Odor Abatement .	21
4.0	ENVIRONMENTAL SETTING.....	23
4.1	TOPOGRAPHY	23
4.2	Geology	23
4.2.1	Regional Geologic Setting.....	23
4.2.2	Local Geologic Setting	25
4.3.	Hydrology	25
4.3.1	Surface Water	25
4.3.2	Groundwater.....	26
4.4	Air/Wind.....	26
4.4.1	Climate	26
4.4.2	Air Quality.....	27
4.4.3	Odors	30
4.5	Local Ecology	32
5.0.	SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs)	34
5.1.	Solid Waste Management Units.....	36
5.1.1.	Tank Farm Area	36
5.1.1.1	Tank Farm.....	36
5.1.1.2	Sump Tank X-508	39
5.1.2.	Process Area.....	40
5.1.2.1	Re-Refinery	40
5.1.2.2	Mohawk Treatment	41

5.1.3 Wastewater Treatment Area - DAF Area	42
5.1.3.1 DAF Unit (New and Old)	42
5.1.3.2 Treated Wastewater Tanks T-704A and T-704-B	43
5.1.4. West Loading/Unloading Area	44
5.1.4.1 Bobtail Loading/Unloading Area.....	44
5.1.4.2 Transporting Loading/Unloading Area	45
5.1.5. Filter Wash Area	46
5.1.6 Sump Tank X-510	46
5.1.7 Detention Sump 2	47
5.1.8 Pumping and Valve Station West of Tank Farm	48
5.1.9 Pumping and Valve Station South of Tank Farm	49
5.1.10 Pumping and Valve Station East of Tank Farm	50
5.1.11 Sump Tanks 453/454 Area	50
5.1.11.1 Sump Tank 453.....	50
5.1.11.2 Sump Tank 454.....	50
5.1.12 Detention Sump 1	52
5.1.13 Ten Day Transfer Station.....	52
5.1.14 Railcar Loading Area 1	53
5.1.15 Underground Pipes/Ditches/Trenches/Catch Basin	54
5.2. Areas of Concern	55
5.2.1. Raw Materials/ Product Tanks	55
5.2.2. Main Plant Storm Water Outfall to Flood Channel	56
5.2.3. Discharges to Union Sanitation District - Lift Station	58

5.2.4. Maintenance Shop	61
5.2.5. Laboratory	62
6.0 VISUAL SITE INSPECTION	63
6.1. Purpose	63
6.2 Summary	63
7.0. EXPOSURE PATHWAYS AND HUMAN AND ENVIRONMENTAL RECEPTORS -	64
7.1. General human and Environmental Receptor	64
7.2 Surface Water Migration pathways and Receptors	65
7.3 Soil Migration Pathway and Receptors.....	65
7.4 Groundwater Migration Pathway and Receptors	66
7.5 Air Migration Pathways and Receptors	67
8.0 POTENTIAL MIGRATION PATHWAYS	68
8.1. General	68
8.2. Physical Properties of Contaminants	68
8.3. Behavior of Potential Contaminants in the ENVIRONMENT	68
8.4. Physical Conditions Affecting Migration	70
8.5. Risk Characteristics of Constituents of Concern	70
9.0 RECOMMENDATION - ENFORCEMENT CONFIDENTIAL	71
10.0. REFERENCES.....	74

LIST OF ATTACHMENTS

Attachment A Figures

Attachment B Tank and Equipment Table

Attachment C Agency's Incidents Reports

Attachment D Photos

Attachment E MSDS Sheets

Attachment F Process Unit Descriptions

1.0. INTRODUCTION

This Resource Conservation Recovery Act (RCRA) Facility Assessment (RFA) for the Evergreen Oil, Inc., located at 6880 Smith Avenue, Newark, California (EPA I.D. No. CAD 980887418) was prepared for U.S. Environmental Protection Agency (EPA). This RFA has been completed in accordance with the State of California, Department of Toxic Substances Control Corrective Action Manual (June 1994) and EPA's RCRA Facility Assessment Guidance (EPA/530-86-053).

1.1. Purpose of the RCRA Facility Assessment

The 1984 Hazardous and Solid Waste Amendments (HWSA) to RCRA provide authority to the Environmental Protection Agency (EPA) to require comprehensive corrective action for all releases of hazardous waste or hazardous constituents associated with all activities at the facility which includes spills of wastes not originating from SWMUs (RCRA 3001(h)). The corrective action provision (HWSA 3004(u)) focuses on investigating releases from all Solid Waste Management Units (SWMUs) and other areas of concern (AOCs). A SWMU is defined as any discernible waste management unit at a RCRA facility from which hazardous waste or constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. The SWMU definition includes:

- RCRA regulated units, such as container storage area, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, and underground injection wells.
- Closed and abandoned units.
- Recycling units, wastewater treatment units and other units which EPA has generally exempted from permitting standards.
- Areas contaminated by "routine, deliberate, and systematic release" of hazardous wastes or hazardous constituents.

The purposes of this RFA are the following:

1. To identify and gather information on releases at this RCRA-regulated facility.
2. To identify and evaluate SWMUs and AOCs relative to releases into or affecting all media e.g. soil, ground water, pore liquid, pore gas, air, or surface water, and regulated units for releases other than to groundwater. A SWMU is defined as any discernible waste management unit at a

RCRA facility from which hazardous waste or constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste.

3. To make preliminary determination regarding the need for further action and interim measures for releases into any medium from the facility.
4. Determine which SWMUs may not pose a further threat to human health and the environment.

The four basic steps of an RFA consist of (1) a preliminary review (PR) of existing files and other generally available or requested information, (2) a visual site inspection (VSI) to confirm and/or obtain additional information of past or present releases (3) when warranted, a sampling visit to fill data gaps by obtaining field and analytical data, and (4) combining the information from the first three steps into a comprehensive RFA report which addresses the need for further investigation of the site, and where warranted, specific corrective measures to remediate the existing releases, prevent further releases, and evaluate the potential for future releases of hazardous wastes.

In this RFA, documents describing the site location and configuration, operative history, environmental setting, existing degree and extent of contamination, potential migration pathways, and potential impacts of existing contamination at the Facility were reviewed to evaluate the potential for contaminant releases to environmental media (e.g., air, soil and water).

1.2 General Procedures Used for Information Gathering

This RFA report for Evergreen provides a comprehensive summary of the information obtained from the file review of regulatory agencies' files and the VSI. No sampling visit was conducted. The primary source of information utilized in this facility assessment includes files and correspondence of the other agencies and Department of Toxic Substance Control (DTSC) and the on-site inspection conducted on January 27 and 28, 2004. The files of the San Francisco Regional Water Quality Control Board (RWQCB), Bay Area Air Quality Management District (BAAQMD), the Union Sanitation District (USD) and the City of Newark Fire Department were reviewed.

1.3 Facility Name, US EPA ID Number, Dates of Completion of PR, VSI, and SV (if applicable)

EVERGREEN OIL INC.
6880 SMITH AVENUE
NEWARK, CALIFORNIA
EPA I.D. No. CAD 980887418

Preliminary Review completion date: January 28, 2004
Visual Site inspection dates: January 27 and 28, 2004
Sampling Visit: None

2.0. SITE DESCRIPTION

This section describes, in general, the location, configuration of the Facility and the land use designations for the facility, surrounding area and facility processes and waste management.

2.1. Site Location

The Evergreen Oil, Inc. (EOI) facility is located at 6880 Smith Avenue, in the City of Newark, Alameda County, California. The Assessor's Parcel Number assigned to the site by the Alameda County is 092A230001003. The location of the facility can also be described as latitude 37°31'15" N, longitude 115°01'15" W, township T55, Range R1W, section 6. The site is approximately ½ mile west of I-880 and can be accessed via Mowry Avenue or Thornton Avenue interchanges.

EOI is located on a 7-acre site is zoned MG (General Industrial) and is located within an urbanized area surrounded by industrial sites. Land use immediately surrounding the project site is not zoned for residential use; it is chiefly industrial and commercial. The site is surrounded to the west and south primarily by open land, salt ponds, wetlands and the San Francisco Bay, but most of the project area to the north and east is suburban and zoned low-density residential. See Attachment A for the facility map.

The closest off-site human receptors are employees of the surrounding business. A large truck terminal is located adjacent to the northern property. Other businesses include a pallet factory located to the southwest of the EOI facility at the end of Smith Avenue. A construction equipment distributor is located across Smith Avenue to the west of the EOI facility. Another truck terminal facility is located east of the EOI facility.

The closest human receptors, other than EOI employees, would be the employees of the truck terminal located approximately 125 feet north of the EOI northern boundary. The closest residential receptor is located approximately northeast of Cherry Street, approximately 1,400 feet north of the EOI facility.

According to information available from the Alameda County Water District (ACWD), the depth to the Newark aquifer at the facility site is approximately 12.5 feet. The facility is located at an elevation of approximately 21 feet above Mean Sea Level. Therefore groundwater is located approximately eight and half feet above Mean Sea Level. Due to the proximity of the San Francisco Bay, to the south, the Newark aquifer has a chloride content of approximately 10,000 mg/l and is unfit for domestic uses.

2.2 Owner/Operator History

The EOI facility was built in 1985 on a previously undeveloped parcel, and has been operating under a State Permit issued in Oct. 1985. The EOI facility was issued a Class

3 Permit Modification on May 9, 2002. The existing facility consists of storage tanks, re-refining processes and administrative offices and laboratory. The facility accepts used oil and antifreeze. The used oil is re-refined into base lube oil products, asphalt, and distillate fuel products. Antifreeze is sent out for treatment. Evergreen Oil, Inc. is a wholly owned subsidiary of Evergreen Holdings, Inc.

2.3. Facility Processes and Waste Management

2.3.1 The Current Facility Processes and Waste Management

The current EOI operations include receiving, storing, and treating used oil as defined in the California Health and Safety Code (H&SC) section 25250.1, non-RCRA contaminated petroleum products, non-hazardous wastewater treatment, storage and transfer of antifreeze, and on-site generated RCRA fuel. Most of the used oil received at the facility is treated to produce oil meeting the recycled oil standards specified in H&SC section 25250.1(a)(3)(B). EOI uses two methods for treating used oil: blending and re-refining. Blending is conducted in tanks and involves mixing of incoming used oils with other used oil or with re-refined oil products to meet the recycled oil standards. The re-refining process includes the following processes: chemical treatment, dewatering, fractionation, vacuum distillation, and hydrofinishing. The re-refining process produces gasoil, lube distillate, asphalt flux, and different grades of base oil products. Evergreen is proposing to only use the re-refinery for certified used oil re-refining and go through closure for the past activities of the hazardous waste used oil re-refining. Used oils, which cannot be economically treated at the EOI facility are stored and then transported to other authorized facilities.

Treatment facilities employed to produce the recycled oil include receiving tanks (where blending of individual loads of used oil occurs), and designated storage tanks where used oil is blended and certified to meet recycled oil specifications. EOI receives used oil and waste antifreeze mostly from transfer stations, which are operated by EOI dba Evergreen Environmental Services, a wholly owned subsidiary of Evergreen Holdings, Inc. The transfer stations have Standardized Hazardous Waste Facility Permits. The collection of used oil and waste antifreeze is managed through a modified manifest procedure. The transfer stations have their waste acceptance procedures. Wastes received at the plant are handled in the following manner:

- Used oil is processed into lubricant base oil, fuel, and asphalt flux
- Oily debris, soils, articles, and other solids are manifested and shipped to an appropriate disposal facility (10-day storage only)
- Used antifreeze is consolidated in a tank (Tank T-501D) and shipped to a recycler

- Used oil filters are shipped to a recycler in drums
- Used oil with high water content is accepted at the plant. This material is either blended with other used oil waste and shipped as certified fuel or transported off-site for treatment at a permitted TSDF facility

The used oil, antifreeze, and used oil with high water content received at the facility comes in bulk by truck. The wastes listed above (e.g., oily debris and oil filters) are received at the facility in drums, stored on site for 10 days or less, and then transferred to other permitted facilities. No waste is disposed on site. If the waste is not permitted for handling at the plant, it is returned to the generator or, at the request of the generator, shipped to another appropriate treatment and/or disposal facility. See Attachment A for facility map.

2.3.2. Proposed Facility Processes and Waste Management

Evergreen Oil, Inc. has applied for permit authorization for storage, blending, gravity separation, and treatment of hazardous waste including used oil, RCRA and non-RCRA oily waste waters, waste antifreeze, RCRA fuel and contaminated petroleum products, with a maximum capacity of 692,000 gallons; 4 rail cars loading/unloading stations with storage capacity of 23,000 gallons for each car; 2 roll-off bins with a total storage capacity of 40 cubic yards; 3 storage pads for containers of RCRA and non-RCRA wastes with a maximum capacity equivalent to 1008 55-gallon drums; install drum crushing unit. This permit also authorizes the management of used oil in aboveground tanks with a maximum annual throughput of 45 million gallons. In addition, this permit authorizes 10 million gallons per year of consolidation of containerized waste, one million gallons per year of antifreeze, five million gallons per year of RCRA fuel blending, 55 million gallons per year of RCRA and non-RCRA wastewater treatment (in the existing DAF and new waste water treatment unit). See Attachment A for the proposed facility map.

Only the recycled oil is to be processed in the re-refinery, and thus, the re-refining operation is not part of this proposed permit. The partial closure plan approval of the re-refinery will be at the same time with the approval of the Part B Permit Application.

Evergreen is proposing to expand its recycled oil refinery section to re-refine 26,805,600 gallons annually producing base lube oil, fuel oils and asphalt products.

Hazardous wastes are accepted in drums, bulk tanker trucks, and rail cars. The wastewater received from off-site and generated on-site from re-refining is treated in the waste water treatment system and batch discharged to publicly owned treatment works (POTW). The solids from the wastewater treatment are

consolidated into roll-off bins for off-site shipment. The wastewater treatment system includes blending, pH adjustment, metal and oil removal, gravity separation, air stripping, chemical oxidation of phenols and carbon absorption.

Used oil filters are also accepted at the container storage area. Only used oil drained from the used oil filters is regulated as hazardous waste. Oil contaminated with more than 1000 ppm total halogens is presumed to be a hazardous waste because it has been mixed with halogenated hazardous waste as listed in subpart D of 22 CCR, section 66261. This oil is a RCRA hazardous waste and is received only for consolidation, storage, and transfer to an off-site facility.

Empty drums and used oil filters will be crushed using a hydraulic drum crusher. In the case of used oil filters, a collection device will be used to accumulate the used oil. The oil will be tested and transferred to receiving tanks. Crushed filters will be transferred to a drum or roll-off bin for off-site transfer.

Detailed descriptions of the proposed units are as follows:

1) Used Oil Management

Evergreen Oil is proposing to increase the throughput of the used oil management operation to 45 million gallons annually. This increase in operation requires the installation of new tanks. The expanded facility will include 14 new used oil/product tanks, adding a storage volume of 245,000 gallons, and 6 products tanks, adding a volume of 835,285 gallons. The total capacity of the 30 existing and proposed hazardous waste tanks which includes the three non-RCRA oily water tanks will be 692,000 gallons. The wastewater tanks associated with the proposed wastewater treatment plant is not part of this capacity. The total capacity of the existing and proposed product tanks will be 1,530,855 gallons. Tank Tables are listed in Attachment B.

The following existing tanks will change service:

- T-501C currently stores V-401 material (halogenated RCRA fuel). With the expanded facility this will be re-numbered T-800 and will store halogenated and other RCRA fuels.
- T-503A is permitted for storing used oil. This tank has been storing recycled used oil fuel for many years. This tank will continue storing certified recycled used oil fuel for off site shipment.
- Existing tanks T-506 A and T-506 C will change service from non-hazardous product to used oil service. The tanks will be re-numbered T-506 A and T-506 B.

- Tanks 705 A/B/C and Tank T-706 stores non-hazardous water and will be removed in the expanded facility once the wastewater treatment plant is built.
- T-502 will receive non-RCRA hazardous oily waste and wastewater

Evergreen will continue its existing fuel oil blending operation under the proposed expanded facility permit. The expansion will also include an increase in the fuel-blending throughput. Nine tanks (9) will be used in the used oil fuel-blending unit. The total proposed amount of fuel oil blending managed annually will be 18,194,400 gallons. This volume would consist of 11,456,135 gallons from the used oil fuel blending operation and 6,738,265 gallons from the industrial fuel oil process in the re-refining section. The re-refining section of the facility will be managing recycled oil only, a non-hazardous material and will go through partial closure procedure. Evergreen is proposing to expand its recycled oil refinery section to re-refine 26,805,600 gallons annually producing base lube oil, fuel oils and asphalt products. The total amount of used oil managed by the fuel oil blending, re-refining and industrial fuel units is 45 million gallons annually.

2) RCRA Fuel Blending

In addition to the existing on-site generated RCRA halogenated waste fuel tank T-800, Evergreen proposes to install a new 25,000-gallon tank (T-513) to store RCRA fuel from on-site and off-site sources. RCRA waste codes will be received at the facility and will be shipped off site as hazardous waste. The off-site RCRA fuels will be received in drums and trucks at the west loading/unloading area. The annual throughput of on-site and off-site RCRA fuel is (5) five million gallons.

3) Waste Antifreeze:

Evergreen will continue collecting and storing waste antifreeze on site in Tank T-500. The waste antifreeze is contaminated with used oil and water. While stored in tank T-500, the water and used oil separate and are pumped out for further treatment. The waste antifreeze will be shipped off site for recycling. Evergreen will increase antifreeze throughput to (1) one million gallons annually.

4) Wastewater Management

Evergreen is proposing to receive, consolidate, treat and transfer annually 55 million gallons of hazardous wastewater from off site sources. The wastewater would be treated, tested and then discharged into the POTW line by permit. The treated water characteristics must be below the characteristics of hazardous

waste as defined by California and Federal regulations and the sewer discharge permit limits specified by of the Union Sanitary District (USD). If after treatment, the wastewater still has the characteristics of hazardous waste, then it will be shipped off site to other permitted facilities.

Evergreen is planning to manage the incoming wastewater in two wastewater treatment systems.

i) Wastewater treatment system (WTS-DAF unit) (Also know as the Dissolved Air Floatation Unit -DAF)

Evergreen has a wastewater treatment system (WTS-DAF unit) that treats on-site and off-site non-hazardous wastewater. Evergreen proposes to permit the existing WTS-DAF unit to treat on-site and off-site non-RCRA hazardous wastewater. The WTS-DAF receives wastewater from the cleaning of concrete in the loading and unloading areas, process water from the re-refining section and off-site non-RCRA hazardous wastewater.

These wastes mainly contain low concentrations of dissolved organics, oil, suspended solids and low concentrations of metals. The WTS-DAF unit is designed to treat 40 gallons per minute of wastewater. The annual throughput of the WTS-DAF unit shall not exceed 21 million gallons

The WTS-DAF unit consists of: an oil/water separator, a chlorine dioxide generator, mixers, chemical additives (polymers and coagulants) tanks, air compressor, associated pumps and piping, intermediate tanks, activated carbon canisters, tanks T-704 A & B. Coagulants, flocculent, alkali and air are added to the system to adjust the pH, remove oil and solids particles. Floated solids are skimmed, pumped to a tank and then shipped off -site. Chlorine Dioxide is added to the clarified water to oxidize the phenols and other dissolved organics.

Two sets of activated carbon units provide a continuous supply of active carbon for final polishing of the wastewater. These beds provide final removal of any remaining organic compounds prior to discharge to the sanitary district by permit. Air emissions from the WTS are vented to the vapor recovery system. The WTS-DAF unit will receive wastewater from tanks T-651A & T-651B and Tank T-652. When the WTS-DAF is not operating the wastewater from tanks T-651A T-651B, and T-652 will be pumped to the wastewater treatment plant (WWTP).

ii) Proposed Wastewater Treatment Plant (WWTP)

In addition to the existing WTS-DAF, Evergreen is proposing to install a new wastewater treatment plant (WWTP). This unit is designed to treat

on-site and off site RCRA and non-RCRA hazardous wastewater containing oils, volatile organics, sand, dirt, and sludge, which may also be contaminated with metals and organic contaminants. The treatment plant will consist of the following unit operations: Solids separation, induced air floatation for removal of free and emulsified oil, chemically assisted suspended solids removal in batch reaction tanks, removal of organics dissolved in the water, chlorine dioxide CLO₂ treatment to remove phenols, resin beds to remove the heavy metals, final carbon polishing, holding tanks for post treatment testing prior to release to the sewer, filter press will remove solids from the sludge generated in the treatment, roll-off bin to store the solid before being shipped off site.

Fifteen (15) new wastewater receiving, storage and treatment tanks will be added as part of the proposed wastewater treatment facility with a total capacity of 148,500 gallons. The wastewater trucks will load/unload in the wastewater treatment system containment area. Prior to off loading, each truck will be sampled and analyzed to determine if; 1) material meets the profile description and 2) is treatable by the wastewater treatment system.

Solid waste generated from the wastewater treatment system will be stored in a roll-off bin in the WWTP loading/unloading area. The solid waste will be shipped off site. The plant will be designed to treat 55 million gallons annually. The total amount of wastewater that will be handled in the WTS-DAF unit and the proposed wastewater treatment plant (WWTP) shall not exceed 55 million gallons annually.

5) Container Management:

Evergreen proposes to receive waste in DOT approved containers. The containers will be managed as outlined in the Section IV of the Part B Permit Application. All these operations will take place in secondary containment structures in the facility's loading/unloading; drum storage and consolidation pad areas. The waste in the containers will either be:

- a) Transferred and consolidated into another container, tank, truck or roll-off bin
- b) Solidified
- c) Packed or unpacked

Emissions from drum consolidation, solidification, and transfer operations, including truck transfers will be controlled by on-site vapor recovery equipment. This system will consist of one fume hood, a blower and activated carbon canister. Emissions from the carbon canisters will be monitored as required by permit from the Bay Area Air Quality Management District (BAAQMD). The following hazardous waste management units will be part of the container management at the facility.

i) Drum Storage

Evergreen is proposing to construct three-drum storage and one-consolidation pads. Each drum pad will be designed to store a maximum of 336 drums. The size of the each drum pad is 38 by 86 feet.

- a) Drum Pad # 1 will store 240 55-gallon drums of non-RCRA and RCRA (excluding flammable, reactive and corrosive) solids and liquids, 96 55-gallon drums of acids, and 20 gas cylinders.
- b) Drum Pad # 2 will store 240 55-gallon drums of flammables, combustibles, and fuels, 32 55-gallon drums of reactive wastes, and 64 55-gallon drums of toxics.
- c) Drum pads # 3 will store 240 55-gallon drums of non-RCRA and RCRA (excluding flammable and corrosive) solids and liquids, 64 55-gallon drums of bases, and 32 55-gallon drums of oxidizers.

The flammable and reactive containers will be contained separately. A separate sump will be provided for each section of the drum storage area.

The total number of drums that will be stored on the three drum pads at a time is 1008 drums. Evergreen will manage daily 260 drums of waste.

ii) Roll-off Bins

The facility will have two hazardous waste bins to store RCRA and non-RCRA solid waste, crushed drums, oily soil, contaminated rags and empty containers.

- a) One roll off bin is located in the loading/unloading (WWTP) and will store solid waste generated from the wastewater treatment plant (WWTP) filter press and other waste generated on the facility. The solid waste will be shipped off site for disposal as hazardous waste. The size of the roll-off bin is 20 cubic yards and has a top cover.
- b) One bin will be located at the consolidation pad and will store solid waste. The solid waste will be shipped off site as hazardous waste. The size of the roll-off bin is 20 cubic yards and has a top cover.

iii) Consolidation Pad

The consolidation pad is located next to the drum storage area. The pad is 40 by 65 feet and is contained within 6-inch berm. Solid and liquid waste will be consolidated, solidified, transferred and repacked at the consolidation pad.

A roll-off bin will be placed on the consolidation pad. Crushed drums and

solid waste will be placed into the roll off bin for bulk off site shipments.

Used oil filters will also be drained in containers on the consolidation pad. The empty oil filters will be crushed in the drum crusher

Evergreen proposes to consolidate, solidify, and transfer annually 10 million gallons of waste in drums, trucks, bins, tri-wall boxes, and railcars.

iv) Drum Crusher

A self-contained drum crusher will be located in the consolidation pad. Empty drums will be stored in the drum storage area and consolidation pad prior to crushing. Oil filters will also be crushed in the drum crusher. Crushed drums and filters will be placed in the roll off bin and then shipped off site as hazardous waste. Evergreen proposes to crush 210 drums a week.

6) Truck Loading/Unloading Areas

a) Trucks Loading/Unloading areas:

- i) Evergreen proposes adding a new bobtail truck loading /unloading area on the east side of the facility.
- ii) The facility has an existing West loading/unloading area which consists of two units, bobtail and west loading stations.
- iii) The wastewater treatment plant (WWTP) will have its own loading/unloading area.

All loading/unloading areas are contained concrete structures and are sloped towards one end for the collection of spills or rainwater.

7) Rail Car Loading/unloading Stations

i) Rail Car Station # 1

This is an existing rail car station used for shipping products. With the new permit rail car station # 1 will handle bulk and containerized products and hazardous waste excluding flammable material. Bulk materials will be pumped to and from the rail car and the trucks and tanks. Rail car Station # 1 will be contained with an impervious containment structure. Vapors from bulk liquid loading and unloading operations will be vented to the railcar vapor recovery system.

ii) Rail Car Station # 2

This is a new rail car station. With the new permit rail car station # 2 will handle bulk and containerized products and hazardous waste excluding flammable material. Bulk materials will be pumped to and from the rail cars and the trucks and tanks. Rail car Station # 2 will be contained with an impervious containment structure. Vapors from bulk liquid loading and unloading operations will be vented to the railcar vapor recovery system.

iii) Rail Car Station # 3

Rail car station # 3 is a new station and will handle bulk and containerized products and hazardous waste including flammable material. Bulk materials will be pumped to and from the rail cars and the trucks and tanks. Rail car Station # 3 will be contained with an impervious containment structure. Vapors from bulk liquid loading and unloading operations will be vented to the railcar vapor recovery system.

iv) Rail Car Station # 4

Rail car # 4 is a new station and will handle bulk and containerized products and hazardous waste excluding flammable material. Bulk materials will be pumped to and from the rail cars and the trucks and tanks. Rail car Station # 4 will be contained with an impervious containment structure. Vapors from bulk liquid loading and unloading operations will be vented to the railcar vapor recovery system.

The spills from the rail car stations will flow to the secondary containment of the east loading/unloading area.

8) Oily Water Collection Systems/Sumps

Evergreen has three Oily Water Collection System/Sump units. Sump Tank X-508 is not listed here because it is used to store overflow from tanks in the tank farm and is listed in section 5.1.1.

a) Storm and Oily Water Collection System (Sump Tanks X-453 & X-454)

Storm and oily water Collection System is an existing unit located Northwest corner of the tank farm. The system consists of two fiberglass tanks, X-453 and X-454. X-453 receives oily wash water from the west loading/unloading area, through X-510 sump tank. X-453 also receives used oil samples from the refinery control room. The water from X-453 is pumped to tank T-651A and the oil is pumped to T-502. X-454 receives storm and wash water from

the refinery process area and the tank farm. The storm and wash water from the process and tank farm containment areas gravity flow to the sump tanks. The water from X-454 is pumped to T-651A. Tanks X-453 and X-454 are made of fiberglass structure and are installed below grade in an open concrete sump for containment. X-454 is W 9'3" x H 6' x L 10'6" (4360 gallons) and X-453 is W 4'3" x H 4'6" x L 12'7" (1800 gallons). The tanks are sitting on wooden blocks above the floor of the concrete sump. The Maximum capacity is 2000 gallons a day.

b) Oily and Wash water Collection System, Sump Tank X-510

Sump Tank X-510 is an existing unit located Northwest corner of the tank farm. X-510 receives oily and wash water from the west unloading/loading area, laboratory in office building, maintenance shop floor drain, truck and bobtail west loading/unloading area, truck wash in the west loading/unloading area, and the filter wash pit. The water gravity flows to X-510. X-510 sump tank has a 900-gallon operating capacity and is mounted in a concrete (vault) pit. The sump tank is provided with a board mounted High Level Alarm, LAH-676. An air operated Pump, P-510, is provided to transfer the oily water from the sump tank to the oil/water separator tank X-453. In case the pump of X-510 fails, X-510 overflows to the Detention Sump 2 in the west loading/unloading area. Tanks X-510 is made of fiberglass structure and is installed below grade in an open concrete sump for containment. X-510 is W 5'8" x H 3' 10" x L 6'4" (1000 gallons). The tanks are sitting on wooden blocks above the floor of the concrete sump. Maximum Capacity: 200 gallons a day

Table 2.1 provides a description of materials received at Evergreen plant before and after plant expansion.

Table 2.1
Description of Materials Received at Evergreen Plant With and Without Project

Description	Annual Quantity for Existing Plant	Annual Quantity of Plant With Project	Existing On-Site Management	On-Site Management With Project	1997 Conditional Use Permit
Used Oil from vehicles and industrial oil/water	15.768 million gallons	45 million gallons	Re-refining producing base lube oil, asphalt, and gasoil sold for	Re-refining producing base lube oil, asphalt, and gasoil sold for industrial fuel. Used oil unsuitable for re-refining blended for industrial fuel	33.54 million gallons/year of used oil for re-refining and unquantified

Description	Annual Quantity for Existing Plant	Annual Quantity of Plant With Project	Existing On-Site Management	On-Site Management With Project	1997 Conditional Use Permit
separators			industrial fuel. Used oil unsuitable for re-refining blended for industrial fuel shipped off site.	shipped off site.	volume of off-specification used oil for blending into industrial fuel.
Wastewater from re-refining process and non-hazardous wastewater from customers	13 million gallons	21 million gallons	Dissolved Air Flotation (DAF) unit. Treated water discharged to public treatment plant. Oil returned to re-refining process or shipped off site for disposal.	Dissolved Air Flotation (DAF) unit. Treated water discharged to public treatment plant. Oil returned to re-refining process or shipped off site for disposal.	Process permitted in 1983 Conditional Use Permit
RCRA hazardous wastewater from customers that may contain oil and metals	Not received	55 million gallons		Grit and solids removal, induced air flotation, chemical conditioning, activated carbon absorption, and vacuum stripping. Oil returned to re-refining process. Treated water discharged to public treatment plant. Solids, sludge, and water that does not meet pretreatment limitations shipped off site for disposal. Existing DAF unit would also be used	55 million gallons permitted

Description	Annual Quantity for Existing Plant	Annual Quantity of Plant With Project	Existing On-Site Management	On-Site Management With Project	1997 Conditional Use Permit
				to treat RCRA wastewater. The existing DAF would also be used to treat RCRA wastewater.	
Used oil containing RCRA ignitable liquids, solvents, and contaminated oils	Not received	5 million gallons		Blended in tanks to produce RCRA fuel shipped off site	Permitted but not quantified
Used antifreeze	750,000 gallons	1 million gallons	Stored in tanks and transferred to off site recycling facility.	Stored in tanks and transferred to off site recycling facility.	Permitted but not quantified
Drummed wastes classified as ignitable, toxic, or corrosive under RCRA		10 million gallons	Transferred to off site disposal facility within 10 days of receipt.	Consolidation of compatible hazardous wastes in trucks, drums, roll-off bins, tri-wall containers, and rail cars for shipment by truck or rail to off site disposal facility.	Permitted not to exceed 10 percent of total incoming waste volume.
Virgin ethylene glycol (antifreeze)	Not received	360,000 gallons		Stored in tanks and shipped off site in drums or tank trucks to customers.	Not covered in permit

ESTIMATED AND ANNUAL QUANTITIES OF WASTES HANDLED

<u>Waste Category</u>	<u>Maximum Annual</u>	<u>Units</u>
Used oil	45,000,000	Gallons
Wastewater	35,000,000	Gallons
RCRA Fuels	5,000,000	Gallons
Consolidation & Transfer	10,000,000	Gallons
Antifreeze	1,000,000	Gallons

3.0. REGULATORY INVOLVEMENT AND EVERGREEN ACTIONS

In accordance with applicable federal, state and local regulations pertaining to the processes and equipment employed by Evergreen Oil at the Facility, Evergreen obtained the necessary permits for specific types of operations listed below:

3.1. U.S. Environmental Protection Agency, State, and Local Permit Status

3.1.1. U.S. Environmental Protection Agency

The existing facility is a permitted used oil recycling facility under State permit to store, treat and transfer used oil and antifreeze and is not regulated by US EPA. The proposed facility modification and expansion will handle RCRA regulated waste and will be regulated by US EPA.

3.1.2. The City of Newark

The City of Newark and the California Department of Toxic Substances Control (DTSC) have issued respective permits for various activities conducted at the Evergreen facility since 1983. Certain activities that were approved by the City of Newark through its land use authority in 1997 have not yet been permitted by DTSC through its authority to regulate hazardous waste treatment, storage, and disposal facilities. The following provides a summary of events related to activities approved at the Evergreen facility by the City of Newark. This understanding is necessary to ensure that the environmental implications of project activities being considered by both jurisdictions are understood.

In 1983, the City of Newark granted a Conditional Land Use Permit to Evergreen Oil Recyclers, Inc. for the existing plant (Planning Commission Resolution No. 970). This permit was for processing and storing only hazardous waste classified as lubrication oil products by DTSC.

- Since the initial Conditional Use Permit, Evergreen has also accepted used antifreeze at the plant for consolidation and shipment to a recycler. This additional use of the property was sanctioned as part of the new Conditional Use Permit issued by the City of Newark in March 1997.

In 1997, a Negative Declaration was prepared by the City of Newark in accordance with the requirements of Public Resources Code Section 21000 et seq. and the CEQA Guidelines, Section 15070 et seq. of Title 14, California Code of Regulations. The Negative Declaration was certified on March 5, 1997.

The City of Newark approved an updated modified Negative Declaration on January 17, 2003. The City of Newark approved the project conditional upon DTSC's approval of Evergreen's Part B permit application and the acceptance and approval of the Health Risk Assessment (HRA) for this project. The updated modified Negative Declaration was certified by the City of Newark Council on

March 13, 2003. Resolution No. 970 is the Land Use Permit from the City of Newark.

Evergreen obtained a permit from the Bay Area Air Quality Management District (BAAQMD) and from the City of Newark and installed a thermal oxidizer in April 2003. Evergreen proposes to continue using the existing process heater and add a new, smaller process heater to meet the needs of the expanded facility.

3.1.3. The City of Newark Fire Department

The City of Newark Fire Department is the local agency overseeing the hazardous waste management activities at the facility. On July 15, 2002, The City of Newark issued 2002-2003 Unified Program Registration Certificate and Newark Fire Department Hazardous Materials Storage Permit. Spills and other incidents related to hazardous waste and materials are known to have occurred at various locations within the Evergreen Facility. The City of Newark Fire Department has maintained records of known incidents since approximately 1985. The records are available regarding spills and discharges to air, ground surface and water including the date, location, type and quantity of material released, the nature of the release and agency notifications. Newark Fire Department has responded to each complaint to confirm if releases or odor came from Evergreen and how the recorded releases were addressed by Evergreen, some of which were performed without Agency oversight. See Attachment C for a summary of major incidents.

3.1.4 Bay Area Air Quality Management District (BAAQMD)

BAAQMD is responsible for issuing permit to construct and to operate as well as monitoring the facility to meet the minimum air quality standards. On October 30, 2003, The Bay Area Air Quality Management District issued an Authority to Construct and Permit to Operate to Evergreen Oil, Inc., Newark Facility. It includes all the proposed activities at the facility. See Attachment C for the copies of the BAAQMD October 30, 2003 letters to Evergreen for Authority to Construct and Permit to Operate.

3.1.5 State Water Quality Control Board and California Regional Water Quality Control Board, San Francisco Bay Region

Storm water discharges from the property are done under a Statewide General Industrial Activities Storm Water Discharge Permit (2 01S002586) issued by State Water Resources Control Board, monitored by the San Francisco Bay Regional Water Quality Control Board. Storm water from portions of the Evergreen property not used for receiving or processing wastes (e.g., office buildings and undeveloped portions of the property) is collected in a storm water drainage system and discharged into the flood control channel located along the western boundary of the property. Storm water from the containment area is first tested in Evergreen's on site laboratory for contamination. If the water is clean, it is discharged to the flood control channel. If the water is contaminated, it is pumped to the wastewater treatment unit. Evergreen has installed an inflatable plug in the storm water outfall from the plant to prevent accidental releases to the flood control channel.

3.1.6 Department of Toxic Substances Control (DTSC)

In October 1985, DTSC issued a state permit for the facility. In May 1998, Evergreen submitted a Permit Renewal and Modification request to DTSC seeking approval to conduct the activities previously contained in the 1997 Conditional Use Permit issued by the City of Newark.

In December 2000, DTSC granted Evergreen's Temporary Authorization for the following activities:

- Increase the re-refining flow rate from 17 to 30 gallons per minute (gpm).
- Remove the restrictions on the water content of used oil
- Receive in Tank-501D and shipment off-site antifreeze containing ethylene glycol
- Use the Mohawk treatment in the re-refining process

In May 2002, DTSC approved a Class 3 Permit Modification that permanently incorporated the above activities into Evergreen's existing permit. The following Table 3.1 shows the permit modifications issued to Evergreen Oil for modification of the October 1985 permit. Currently, Evergreen has applied for a permit renewal with major modifications to the facility.

Table 3.1

Modification: Approval Date Class Facility or DTSC Initiated	Description	Affected Units

Modification: Approval Date Class Facility or DTSC Initiated	Description	Affected Units
April 16, 1997 Class I Facility Initiated	The modification authorized Evergreen Oil, Inc. to blend different batches of used oil to produce fuels.	Tank storage
May 27, 1999 Class I Facility Initiated	The modification authorized Evergreen Oil, Inc. to replace unit V-424 with a functionally equivalent unit.	Process vessel
May 9, 2002 Class 3 Facility Initiated	<p>The modification authorized Evergreen Oil, Inc. to</p> <ol style="list-style-type: none"> 1. Increase the used oil process capacity from 17 to 30 gallons per minute. The total authorized annual throughput for used oil shall not exceed 15,768,000 gallons. 2. Remove the restrictions on the water content of the used oil. 3. Authorization to receive, store in Tank 501 D and ship off-site antifreeze containing ethylene glycol. 4. Include the Mohawk Treatment in the re-refining process. 	Re-refining process vessels, Tank Storage, loading/unloading area

3.1.7 Union Sanitation District (USD)

The Facility has the following permits from USD:

Industrial Wastewater Discharge Permit No. 268

See Attachment C for a history of major permit violations.

3.2. Evergreen Actions and Modification Projects for Odor Abatement

Spills and other incidents related to hazardous materials are known to have occurred at various locations within the Facility. The following is a 4-year progress report on Evergreen's vapor recovery and odor abatement projects, some of which were performed voluntarily at Evergreen facility to mitigate odor releases.

In the year 2000, most of the hazardous waste storage tanks were vented to 55-gallon activated carbon drums for vapor recovery and odor abatement. Not all storage tanks were connected to the vapor recovery system.

In the year 2001, the hazardous waste storage tanks were connected to the vapor recovery system. A new vapor blower was installed in the vapor recovery system to collect vapors from the hazardous waste storage tanks and direct it to the process heater where it was burned. The process heater was used as the primary odor abatement equipment. Activated carbon canisters were used as secondary odor abatement equipment. Four-foot diameter and seven feet high activated carbon canisters replaced the 55-gallon units.

In the year 2002, Evergreen started implementing the following odor abatement projects. All projects were permitted and completed by April 2003:

- 1) Installation of a new and efficient vapors scrubber for the hot oil heater flue gases.
- 2) Installation of a vapor recovery system on the asphalt loading rack.
- 3) Modifications to the piping system for Vessels 401/V-701, which handle waste gas containing Mercaptans. The modifications would reduce the possibility of a release of Mercaptans during system maintenance.
- 4) Upgrade of vapor control system piping and installation of a thermal oxidizer to capture "breathing" losses from the waste tanks that may contain odorous material.
- 5) Install improved tank volatile containment devices and piping, which will reduce emissions when tank are being filled.
- 6) Bottom loading of trucks and tank cars to eliminate odors from the loading operation.

On September 29, 2003, the Bay Area Air Quality Management District (BAAQMD) informed Evergreen that the facility is subject to the provisions of District Regulation 7, Odorous Substance. The complaints were caused by a blockage in the vapor recovery line. The line was cleaned. Since then Evergreen implemented the following odor abatement projects:

- 1) Install a cover for the Dissolved Air Floatation System, wastewater treatment system.
- 2) Install gauges on the vapor recovery piping and tanks to ensure that the piping is under vacuum.

- 3) Clean the vapor recovery piping during the shutdowns to prevent accumulation of solids inside the pipes.
- 4) Install a knock out pot on the asphalt tanks vapor lines to remove any entrained liquids from entering the vapor recovery system.
- 5) Install a carbon canister on the discharge of the vacuum trucks compressor, during loading and unloading, to adsorb any odorous material.
- 6) Replace the steam stripper packing for efficient removal of sulfur and volatile organic compounds.

In 2004, EOI had one odor incident. The cause of the odor was leaks from the waste water treatment system (DAF) covers. The covers had small openings that did not seal the process vessels tightly.

To prevent future odor incidents from the DAF, EOI implemented the following:

- 1) Replace the acrylic covers with stainless steel covers on the DAF process vessels.
- 2) Elevate the sludge tank on the DAF unit so that the inlet pipes enter from the side of the tank and not from the top making it easy to install the cover.
- 3) Close the gaps in the oil/water separator cover.
- 4) Install a sight glass on the water line out of the DAF.
- 5) Install a vapor recovery blower on the DAF unit to supplement the main blower of the facility vapor recovery system.

Evergreen reported that by implementing the above projects, the odor complaints have decreased significantly.

4.0 ENVIRONMENTAL SETTING

4.1. Topography

The site is about 15 feet above sea level. The topography is generally flat and slopes gently toward the south with a maximum relief of about 5 feet. Salt evaporators lie west and south of the Evergreen plant. Coyote Hills, a series of northwest-trending low hills lie within 2 miles to the northeast of the plant and reach a maximum elevation of about 290 feet.

4.2. Geology

4.2.1. Regional Geologic Setting

The site is located on the east side of San Francisco Bay within the San Francisco Bay Basin which lies within the Coast Ranges Geomorphic Province of northern California. The Coast Ranges Province is characterized by northwest-trending mountain ranges and valleys that are parallel to major faults. San Francisco Bay lies approximately 2 miles to the west of the site. The San Francisco Bay Basin is a northwest-trending basin bounded on the east by the East Bay Hills and on the west by the San Francisco Peninsula. The basin is a down-dropped block between two northwest-trending fault zones. The Hayward fault zone bounds the block on the east and the San Andreas fault zone bounds it on the west.

Regional faults capable of causing significant ground shaking at the site include the San Andreas, Hayward, and Calaveras faults. Other faults are capable of producing noticeable ground shaking at the site, but it would be of relatively less intensity than the San Andreas, Hayward, and Calaveras faults. The Silver Creek fault is a Quaternary fault that is exposed in the San Jose area (Hart et al. 1981) and some maps show it extending beneath alluvial sediments to the vicinity of Coyote Hills within 2 miles of the site (Wagner et al. 1990, Jennings 1994). However, the Silver Creek fault does not show evidence of displacement of material of Holocene age and is therefore not considered active under the Alquist-Priolo Act.

Table 4.1 shows three faults, their distance from the site, and the peak ground acceleration each source would produce at the site during a maximum credible earthquake (MCE) and a maximum probable earthquake (MPE). The peak ground accelerations were calculated using three separate published attenuation relationships by Sadigh et al. 1993, Idriss 1993, and Boore et al. 1993, and averaging the results of the three.

Table 4.1
Major Regional Faults

Fault	Distance from Site (Miles)	Maximum Credible Earthquake (MCE)	Maximum Probable Earthquake (MPE)	Peak Ground Acceleration for the MCE	Peak Ground Acceleration for the MPE
San Andreas	15	8.5	8	0.50	0.30
Hayward	3	7.5	7	0.60	0.55
Calaveras	8	7	7	0.40	0.40

The San Andreas fault, located 15 miles southwest of the site, was the source of the moment magnitude (M_w) 8 San Francisco earthquake of 1906, which caused extensive damage in San Francisco and elsewhere in the Bay area, and of the M_w 7 Loma Prieta earthquake of October, 1989. The estimated maximum credible Richter magnitude (M_L) for the San Andreas fault is 8.5 (Wesson et al. 1975). According to the Working Group on California Earthquake Probabilities, the "expected" earthquake on the San Francisco Peninsula segment of the San Andreas fault is in the range of M_w 6.5 to 7 and on the North Coast segment of the fault it is M_w 8. The estimated probabilities for occurrence of those events during the period 1990 to 2020 are 37 and 2 percent, respectively (WGCEP 1990).

The Hayward fault is the closest of the regional faults and has been responsible for major earthquakes in 1836 and 1868. The magnitudes of these earthquakes have been estimated to be in the range of M_w 6.8 to 7. This fault extends about 60 miles from Mt. Misery, east of San Jose to San Pablo Bay. The results of recent studies indicate that the Hayward fault is segmented; the 1836 earthquake is believed to have occurred on the northern segment and the 1868 earthquake is believed to have occurred on the southern segment. The Hayward fault is considered capable of producing a similar major earthquake in the relatively near future (WGCEP 1990).

In the Earthquake Planning Scenario for the Hayward fault, prepared by the California Division of Mines and Geology (Steinbrugge et al. 1987), the scenario earthquake was of magnitude 7.5, with faulting extending 62 miles, and a maximum offset of up to 10 feet (average 5 feet). This assumes that the total length of the fault would rupture, which was not considered by the Working Group on California Earthquake Probabilities (WGCEP 1990). More realistically, the northern and southern segments of the fault would rupture independently of one another. Therefore, the maximum probable earthquakes for each of these segments is considered to be M_w 7. The Hayward fault is the controlling fault for the Evergreen plant, and under MPE conditions, it is considered capable of causing a ground acceleration of 0.55g at the site.

The Calaveras fault, located 8 miles east of the site, is a major component of the San Andreas fault system extending about 78 miles from the vicinity of Hollister on the south to the vicinity of Danville on the north. It was the source of earthquakes of magnitude greater than 5 in 1897, 1911, 1949, 1955, 1979, and 1984 (Hoose 1987). The

strongest of those was a magnitude 6.5 event near Mount Hamilton in 1911. The Calaveras fault is believed capable of producing an earthquake in the same magnitude range as could be produced by the Hayward fault (Slemmons and Chung 1982).

4.2.2. Local Geologic Setting

The site is about 15-21 feet above sea level. The topography is generally flat and slopes gently toward the south with a maximum relief of about 5 feet. Salt evaporators lie west and south of the Evergreen plant. Coyote Hills, a series of northwest-trending low hills lie within 2 miles to the northeast of the plant and reach a maximum elevation of about 290 feet.

The site is underlain by a sequence of recent alluvial deposits of clay, followed by sediments of the Alameda formation, and finally bedrock of the Franciscan Assemblage. Shallow soils underlying the site consist of stiff to medium stiff silty clay. Groundwater occurs in sandy material between 6 and 12 feet below the surface.

Soils at the site belong to the Pescadero Clay. It has low strength, is poorly drained, and is reported to have a moderate to high shrink-swell potential (Soil Conservation Service 1981). Soil engineering studies at the site found the shallow soils to be only slightly expansive (GEI 1985).

4.3. Hydrology

4.3.1. Surface Water

There are no bodies of water at the site. Salt water evaporation ponds owned and operated by Cargill for the commercial production of salt are located about 900 feet southwest of the Evergreen plant. A flood control channel is located along the western site boundary. This channel, owned by Alameda County, drains to Mowry Slough (about one mile from the site) and ultimately into San Francisco Bay. The flood control channel has no officially designated beneficial uses in the San Francisco Basin Plan with regard to water quality; however, the channel is an important flood control feature and provides some wildlife habitat.

The San Francisco Regional Water Quality Control Board (RWQCB) identifies a number of beneficial uses of the San Francisco Bay that must be protected (RWQCB 1991). These beneficial uses include:

- Industrial process supply
- Water contact and non-contact recreation
- Navigation
- Ocean commercial and sport fishing

- Wildlife habitat
- Preservation of rare and endangered species
- Estuarine habitat
- Fish migration
- Shellfish harvesting

The City of Newark is a co-permittee in the Alameda County Urban Runoff Clean Water Program, a program under the Clean Water Act to maintain and improve water quality conditions in the San Francisco Bay and all local water bodies by reducing the amount of pollutants in urban runoff.

4.3.2. Groundwater

The Evergreen plant is located within the Niles Cone sub-area of the South Bay Groundwater Basin. The uppermost aquifers in the Niles Cone sub-area are the Newark and Centerville-Fremont aquifers (EPA 1992). The Newark aquifer is an extensive gravel layer located between 60 and 140 feet below the ground surface. The Centerville-Fremont aquifer lies below this at between 180-200 feet and 310-340 feet, respectively (EPA 1992). Above the Newark aquifer is the Newark aquitard, which significantly impedes the downward flow of groundwater to the underlying aquifers.

The Newark aquifer is a main conductor of salt eastward from San Francisco Bay. The Alameda County Water District has a well located adjacent to the Evergreen property to extract groundwater and pump it back to the bay, reducing the intrusion of salt into the Newark aquifer. Water pumped from this well is discharged into the flood control channel on the west side of the Evergreen plant. According to information available from the Alameda County Water District (ACWD), the depth to the Newark aquifer at the facility site is approximately 12.5 feet. The facility is located at an elevation of approximately 21 feet above Mean Sea Level. Therefore groundwater is located approximately eight and half feet above Mean Sea Level. Due to the proximity of the San Francisco Bay, to the south, the Newark aquifer has a chloride content of approximately 10,000 mg/l and is unfit for domestic uses.

4.4 Air/Wind

4.4.1 Climate. The climate of the San Francisco Bay Area is classified as Mediterranean, with mild, wet winters, and warm, dry summers. Regional climate is controlled primarily by the Pacific high pressure system over the eastern Pacific Ocean, although local climate is strongly influenced by topography and proximity to the Pacific Ocean and San Francisco Bay. Precipitation occurs mainly during the months of November through April and is generally associated with winter storm systems. Any rainfall that occurs during the summer is usually light and is associated with isolated showers or thundershowers. Data compiled by the National Oceanic and Atmospheric

Administration for the period 1951 to 1979 indicate that the mean seasonal precipitation for the City of Newark is approximately 14 inches. Winds in the project area are predominantly out of the northwest from the late spring through early fall. In the winter, winds are equally likely to be from the east-southeast due in part to winter storms and the absence of a strong thermal trough caused by a southward shift of the Pacific High, as well as by variations in the inland Great Basin High east of California. Average wind speeds are moderate in the project area, averaging 6 to 7 miles per hour (mph).

4.4.2 Air Quality. Currently, there are six criteria pollutants for which both national and state air quality standards have been established: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), particulate matter less than 10 microns in size (PM₁₀), and lead (Pb). Those standards are listed in Table 4.2. The Bay Area Air Quality Management District (BAAQMD) operates a regional network of air quality monitoring stations to identify

**Table 4.2
California and National Ambient Air Quality Standards**

Pollutant	Average Time	California Air Quality Standards	Federal Primary Standards
Oxidants (Ozone)	1 hr	0.09 ppm (1)	0.12 ppm
	8 hr	-- (2)	0.08 ppm
Carbon Monoxide	1 hr	20 ppm	35 ppm
	8 hrs	9.0 ppm	9 ppm
Nitrogen Dioxide	1 hr	0.25 ppm	--
	Annual	--	0.053 ppm
Sulfur Dioxide	1 hr	0.25 ppm	--
	24 hrs	0.04 ppm	0.14 ppm
	Annual	--	0.030 ppm
PM ₁₀ (3)	24 hrs	50 $\mu\text{g}/\text{m}^3$ (1)	150 $\mu\text{g}/\text{m}^3$
	Annual (4)	30 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
PM _{2.5} (5)	24 hrs	--	65 $\mu\text{g}/\text{m}^3$
	Annual	12 $\mu\text{g}/\text{m}^3$ (6)	15 $\mu\text{g}/\text{m}^3$
Lead	30-day	1.5 $\mu\text{g}/\text{m}^3$	--

	Calendar Qtr.	--	1.5 $\mu\text{g}/\text{m}^3$
--	------------------	----	------------------------------

Notes:

- (1) ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms/cubic meter
- (2) "--" indicates no applicable standard
- (3) PM₁₀ = particulate matter 10 microns in size or smaller
- (4) The California annual standard is the geometric mean. The federal annual standard is the arithmetic mean.
- (5) PM_{2.5} = particulate matter 2.5 microns in size or smaller
- (6) This California PM_{2.5} standard was recently adopted by the California Air Resources Board but has not yet been promulgated into law.

Source: California Air Resources Board 1999

Ambient pollutant concentrations. The station nearest the project site is in Fremont. Table 4.3 contains a three year summary (1999 through 2001) of the maximum measured criteria pollutant concentrations at this station. The table also shows the number of exceedances of state and national standards at the station during the three year period.

The Bay Area attains national standards for CO, NO₂, SO₂, particulate matter, and lead. The Bay Area was designated by federal law as a "Moderate" nonattainment area for ozone. The EPA formally redesignated the Bay Area as an attainment/maintenance area for ozone in early 1995. Since that time, the ozone standard has been exceeded and the EPA redesignated the Bay Area as nonattainment for ozone in 1998.

Criteria pollutant emissions from the Evergreen Plant in 2001 are presented in Table 4.4. These data were produced by the BAAQMD based on information provided by Evergreen.

Table 4.3
Background Air Quality Data for the Fremont Area

Pollutant	Average Time	Units	Maximum Concentrations			Number of Days Exceeding State Standard			Number of Days Exceeding Federal Standard		
			1999	2000	2001	1999	2000	2001	1999	2000	2001
Oxidants (Ozone)	1 hr	ppm	0.13	0.10	0.11	3	2	3	1	0	0
	8 hr	ppm	0.086	0.075	0.081	-- ²	-- ²	-- ²	1	0	0
Carbon	1 hr	ppm	5.6	4.8	5.4	0	0	0	0	0	0

Monoxide	8 hrs	ppm	3.1	2.7	2.7	0	0	0	0	0	0
Nitrogen Dioxide	1 hr	ppm	0.112	0.081	0.078	0	0	0	0	0	0
Sulfur Dioxide	Annual	ppm	0.022	0.02	0.019	0	0	0	0	0	0
	1 hr	ppm	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹
PM ₁₀	24 hrs	ppm	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹
	24 hrs	□g/m ³	87.9	58.1	57.6	2	1	3	0	0	0
	Annual	□g/m ³	21	19	20	-- ²	-- ²	-- ²	-- ²	-- ²	-- ²
Lead	30-day	□g/m ³	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹
	Calendar Qtr.	□g/m ³	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹	-- ¹

Source: California Air Resources Board Internet Air Quality Summaries as of December 15, 2002.

¹ Sulfur dioxide and lead are not longer collected at the Fremont monitoring station. No air quality standard exceedances have been measured at Fremont for these pollutants for many years, and the entire Bay Area has been found to be in attainment of standards for these air pollutants.

² Not applicable.

Table 4.4
Criteria Pollutant Emissions from Evergreen Oil Refinery in 2001 (Pounds per Day)

	ROGs	CO	NOx	SO ₂	PM
Existing Process Heater S-1, exhausts thru stack P-1, has scrubber	0.5	4.8	54.8	0.8	0.02
Flare system S-30	0	0.2	0	0	0
Advanced refinery heater S-31	1	5.8	23.2	0.1	0.5
Boiler S-32 (gas-fired only)	0	0	9.7	0	0
2 Feedstock tanks (loading incoming product) S-10 & S-11	25.9	0	0	0	0
4 Lube Oil tanks (exempt sources) S-33-36	2.1	0	0	0	0
Oil collection, truck off load S-22	0.7	0	0	0	0
Pre-selection tanks, S-3 through 6	1.9	0	0	0	0
Railcar loading rack S-52	0.5	0	0	0	0
Dissolved air floatation, S-131	1.2	0	0	0	0
Hydrofinishing Unit, S-56	0	0	0	20.6	0
TOTAL EXISTING SOURCES	33.7	10.7	87.7	21.5	0.52
TOTAL IN TONS PER YEAR	6.15	1.95	16.01	3.92	0.10

Source: BAAQMD emission inventory for Evergreen facility (Plant #1190) for 12/20/2001

4.4.3 Odors. According to official records, the BAAQMD received 175 public odor complaints concerning the plant between August 1, 1990 and February 25, 1997. Of these, 15 were confirmed by the BAAQMD and 160 were unconfirmed. Three incidents lead to Violation Notices, all for creating a public nuisance. On September 29, 2003, the Bay Area Air Quality Management District (BAAQMD) informed Evergreen that the facility is subject to the provisions of District Regulation 7, Odorous Substance. The complaints were caused by a blockage in the vapor recovery line. The line was cleaned. Since then Evergreen implemented the following odor abatement projects:

- 1) Install a cover for the Dissolved Air Flootation System, wastewater treatment system.
- 2) Install gauges on the vapor recovery piping and tanks to ensure that the piping is under vacuum.
- 3) Clean the vapor recovery piping during the shutdowns to prevent accumulation of solids inside the pipes.
- 4) Install a knock out pot on the asphalt tanks vapor lines to remove any entrained liquids from entering the vapor recovery system.
- 5) Install a carbon canister on the discharge of the vacuum trucks compressor, during loading and unloading, to adsorb any odorous material.
- 6) Replace the steam stripper packing for efficient removal of sulfur and volatile organic compounds.

In 2004, EOI had one odor incident. The cause of the odor was leaks from the wastewater treatment system (DAF) covers. The covers had small openings that did not seal the process vessels tightly.

To prevent future odor incidents from the DAF, EOI implemented the following:

- 1) Replace the acrylic covers with stainless steel covers on the DAF process vessels.
- 2) Elevate the sludge tank on the DAF unit so that the inlet pipes enter from the side of the tank and not from the top making it easy to install the cover.
- 3) Close the gaps in the oil/water separator cover.
- 4) Install a sight glass on the water line out of the DAF.
- 5) Install a vapor recovery blower on the DAF unit to supplement the main blower of the facility vapor recovery system.

The used oil processed at the plant contains a small amount of sulfur and mercaptans. In the course of the re-refining process, the sulfur is converted into odorous gases such as hydrogen sulfide. Ammonia is also present in the process equipment. These gases can be odorous at extremely low concentrations. For example, hydrogen sulfide, which has a characteristic rotten egg odor, can be smelled at a concentration of 0.0005 parts per million (ppm). Methyl mercaptan, a common mercaptan in the refinery process which has

a rotten cabbage odor, can also be smelled at the same low concentration as hydrogen sulfide. Ammonia is odorous at a concentration of 5.2 ppm. Hot asphalt also has a distinctive hot oil odor.

While odorous compounds are largely contained within plant equipment, these compounds can be smelled at such low concentrations that small releases can result in off site odors. An assessment of odor complaints about the plant received in 2002 and 2003 was conducted by Evergreen to determine the causes of the odors. That assessment is provided in Table 4.5. Five of the odor complaints received about the plant have not been confirmed and it is possible that some of the odors attributed to the plant were not caused by it.

Table 4.5
Summary of Odor Incidents 2002-2003

ODOR SOURCE	2002	2003	TOTAL
PROCESS HEATER	3	1	4
SCRUBBER	0	1	1
SHUTDOWN	5	3	8
FLARE	0	1	1
COMPRESSOR	0	1	1
BOILER	0	1	1
TANK FARM	4	0	4
CAUSES UNKNOWN	5	0	5
TOTALS	17	9	26

Source: Evergreen Oil Inc., 2004

Due to operational problems, the existing process heater has, at times, failed to completely combust odorous components (primarily mercaptans) of waste fuels, resulting in emissions of odorous compounds. The new scrubber which was designed to remove sulfur compounds from heater exhaust failed once, allowing small amounts of odorous compounds to be released to the air. The new scrubber was installed in June 2002 and was permitted by the City of Newark, DTSC, and BAAQMD.

Vessel 401 handles a relatively light hydrocarbon liquid that often contains mercaptans. At times, repairs must be made to the filters, valves, and other connectors associated with the tank and its piping. While piping associated with the tank is purged of gas prior to opening it for repair, a small quantity of gas may remain in the lines and that gas has been accidentally released in the past during maintenance operations. The same type of odor incidents can happen during plant shutdown when process equipment is opened for

maintenance inspection and repair.

The asphalt loading operation is currently connected to a thermal oxidizer vapor recovery system and the odor problems significantly reduced.

While accidental releases from the Evergreen plant have resulted in odors outside the plant, these odorous compounds are not present in concentrations hazardous to human health. According to the Risk of Upset section of the City of Newark Negative Declaration, the maximum concentrations of hydrogen sulfide, ammonia, and methyl mercaptan that would be released as a result of a credible worst-case accident at the plant following the proposed project would be 3.2, 0.27, and 0.046 ppm, respectively. These concentrations would occur inside plant boundaries, public exposure would be less. Exposure to hydrogen sulfide concentrations of 10 ppm for 1 hour may result in mild eye and throat irritation. Exposure to concentrations of this gas above about 1,000 ppm can be lethal (American Industrial Hygiene Association 1991). Exposure to 300 to 500 ppm of ammonia for 1 hour may result in irritation of eyes, nose, and throat. Exposure to ammonia concentrations of 2,500 to 6,500 ppm for 30 minutes may cause serious injury to the lungs. Concentrations of 10,000 ppm of methyl mercaptan may be lethal (Sax 1979).

4.5. Local Ecology

The Evergreen property has been graded and about 60 percent of the site is occupied by pavement and structures. Plant life at the site consists primarily of ornamental trees, shrubs, and groundcover. No special status plant species are present on site.

The Evergreen property does not support wildlife habitat. There are wetlands, fresh and salt water marshes, and grasslands near the site along the margins of San Francisco Bay. These habitats are found approximately 3 miles from the project site in the San Francisco Bay National Wildlife refuge and Coyote Hills Regional Park. A search of the California Natural Data Base (CNDDDB) was performed for the 7.5 minute USGS quadrangles of Newark, Mountain View, and Niles. Special status plant and animal species identified in the CNDDDB that may occur in these habitats are:

- Salt marsh harvest mouse (*Reithrodontomys raviventris*)
- Saltmarsh wandering shrew (*Sorex vagrans halicoetes*)
- Tricolored blackbird (*Agelaius tricolor*)
- Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)
- Bank swallow (*Riparia riparia*)
- Burrowing owl (*Athene cunicularia*)
- Northern harrier (*Circus cyaneus*)
- California least tern (*Sterna antillarum browni*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- White-tailed kite (*Elanus leucurus*)

- California clapper rail (*Rallus longirostris obsoletus*)

- California black rail (*Laterallus jamaicensis coturniculus*)

The flood control channel adjacent to the western boundary of the Evergreen property contains some vegetation that provides relatively low-value wildlife habitat. Vegetation in the channel is periodically removed by Alameda County to ensure adequate conveyance of flood flows. Cargill maintains commercial salt ponds approximately 900 feet west of the property. These ponds also provide some foraging habitat for birds.

5.0. SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs).

Solid Waste Management Units

The preliminary review of the file materials and observations made during the VSI have resulted in the identification of 15 solid waste management units (SWMUs). A SWMU is any discernible waste management unit at a RCRA facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid and/or hazardous waste. A SWMU includes containers, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, underground injection wells, recycling units, wastewater treatment units, and areas contaminated by routine, systematic, and deliberate discharges from process areas. A SWMU does not include accidental spills from production areas, and releases that are permitted under other environmental programs, or contamination resulting from permitted discharges.

Areas of Concern

As a result of the file reviews and the VSI, 5 Areas of Concern (AOCs) have been identified at Evergreen Oil Facility. An AOC is an area that does not meet the definition of a SWMU; however, it may show evidence of contamination or may require investigation to determine the potential of contamination.

The following SWMUs and AOCs listed in Table 5-1 and Table 5.2 have been identified at this facility. The numerical designation assigned to each SWMU corresponds to its location in this section of the report. Attachment A represents the location of the SWMUs and AOCs at Evergreen Oil facility map. Attachment D presents photographic descriptions of SWMUs and AOCs.

Table 5.1 Summary of Solid Waste Management Units with their Subunits

SECTION	SWMU NUMBER	NAME	DESCRIPTION
5.1.1	1	Tank Farm Area	
5.1.1.1	1.1	Tank Farm	Hazardous waste and Product Tanks Area
5.1.1.2	1.2	Sump Tank X508	1200 gallon, Northwest corner of tank farm
5.1.2	2	Process Area	
5.1.2.1	2.1	Re-refinery	Vacuum dewatering, vacuum distillation, hydro-treating and

SECTION	SWMU NUMBER	NAME	DESCRIPTION
5.1.2.2	2.2	Mohawk Area	fractionation Mohawk treatment area (950 gallon tank, R95, associated pumps, piping and heat exchanger)
5.1.3	3	Wastewater Treatment Area- DAF Area	
5.1.3.1	3.1	DAF Unit	treatment of non-hazardous wastewater
5.1.3.2	3.2	Tanks T-704A and T-704B	Storage of treated wastewater
5.1.4	4	West Loading /Unloading Area	
5.1.4.1	4.1	Bobtail Truck Loading/Unloading Area	40x100 sq.ft. area
5.1.4.2	4.2	Transporting Truck Loading/Unloading Area	50x80 sq.ft. area
5.1.5	5	Filter Wash Area	
5.1.6	6	Sump Tank X510	900 gallon, between transfer and bobtail loading area
5.1.7	7	Detention Sump 2	Sump near SWMU No. 5
5.1.8	8	Pumping and Valve Station West Tank Farm	
5.1.9	9	Pumping and Valve Station South Tank Farm	
5.1.10	10	Pumping and Valve Station East Tank Farm	
5.1.11	11	Sump Tanks 453 and 454 Area	Southwest corner of tank farm
5.1.11.1	11.1	Sump Tank 453	Oil/water separator
5.1.11.2	11.2	Sump Tank 454	Sump Tank

SECTION	SWMU NUMBER	NAME	DESCRIPTION
5.1.12	12	Detention Sump 1	Process Area Sump
5.1.13	13	Ten day transfer Area	Drum transfer area
5.1.14	14	Railcar loading area 1	Product loading
5.1.15	15	Underground Pipes, ditches and trenches	Underground lines throughout the facility

Table 5.2 Summary of Areas of Concern

SECTION	AOC NUMBER	NAME
5.2.1	1	Raw Material Product tanks
5.2.2	3	Main Plant Storm Water-Outfall
5.2.3	4	Discharges to Union Sanitation District connections –Lift Station
5.2.4	5	Maintenance Shop
5.2.5	6	Laboratory

5.1.1 SWMU No.1: Tank Farm Area

Unit Characteristics and the Waste Managed

The SWMU No. 1 consists of two sub units, Tank Farm and Sump Tank X-508.

5.1.1.1- Tank Farm

The Tank Farm has a total of 27 aboveground tanks. Evergreen have used 14 of the aboveground tanks in the management of hazardous waste. Included in Attachment B is a spreadsheet of all storage tanks that have been used in the management of hazardous and non-hazardous waste. The spreadsheet provides information relating to tank capacity, dimensions, date of installation, and hazardous wastes stored in the tanks. Detailed information for each tank

listed can be found in Attachment B. Locations of each of the tanks can be found on the facility map located in Attachment A. All storage tanks used for hazardous wastes are located in a concrete containment structure. Material data sheets for the waste products stored in the tanks can be found in Attachment E.

Table 5.3 is the list of the existing hazardous waste and product tanks in the tank farm area that have or may have come into contact with hazardous waste along with the proposed tank number and the usage after the permit approval. The process unit description of the existing tanks that has been used as hazardous waste tanks (T-501A, B, C, D, T-512A, B, T-502, T-503A, T-505, T-507, T-509, T-651A, B, T-652) are included in Attachment F.

Table 5.3
Existing Hazardous Waste and Products Tanks in the Tank Farm Area

Existing Tank Number	Existing Contents/ Usage	Useable Capacity (Gal.)	Total Capacity (Gal.)	Proposed Tank Number	Proposed Contents/ Usage	Location in the Tank Farm
T-501A	Used Oil	9,158	10,000	T-512B	Used Oil	West
T-501B	Used Oil	9,158	10,000	T-512C	Used Oil	West
T-501C	RCRA Fuels	9,158	10,000	T-800	RCRA Fuels	West
T-501D	Waste Antifreeze	24,532	25,000	T-500	Waste Antifreeze	West
T-512A	Used Oil	9,158	10,000	T-651C	Used Oil	West
T-512B	Used Oil	9,158	10,000	T-512A	Used Oil	West
T-502	Used Oil Fuel Blending	47,632	50,000	T-502	Oily Waste	West
T-503A	Recycled Oil	192,993	200,000	T-503A	Recycled Oil	East
T-503B	Recycled Oil	192,993	200,000	T-503B	Recycled Oil	East
T-504	Lube Distillate	47,632	50,000	T-508C	Base Oil Rundown	Center East
T-505	Used Oil Fuel Blending	47,632	50,000	T-505	Used Oil Fuel Blending	Center West
T-506A	Lube Oil/100 N	47,632	50,000	T-506A	Used Oil Fuel Blending	Center East
T-506B	Lube Oil/100 N	47,632	50,000	T-508D	Base Oil Rundown	Center
T-506C	Lube Oil/100 N	47,632	50,000	T-506B	Used Oil Fuel Blending	Center
T-506D	Lube Oil/100 N	47,632	50,000	T-508B	Base Oil Rundown	Center
T-507	Used Oil Fuel Blending	47,632	50,000	T-507	Used Oil Fuel Blending	Center
T-508	Lube Oil/100 N	47,632	50,000	T-508A	Base Oil Rundown	Center East

Existing Tank Number	Existing Contents/ Usage	Useable Capacity (Gal.)	Total Capacity (Gal.)	Proposed Tank Number	Proposed Contents/ Usage	Location in the Tank Farm
T-509	Used Oil Fuel Blending	24,532	25,000	T-509	Used Oil Fuel Blending	Center
T-510	RGO Rundown	24,532	25,000	T-510	RGO Rundown	Center
T-511A	Asphalt	35,034	35,285	T-511A	Asphalt Flux	Center
T-511B	Asphalt	35,034	35,285	T-511B	Asphalt Flux	Center
T-651A	Used Oil	30,514	31,000	T-651A	Non-RCRA Oily Water	Center west
T-651B	Used Oil	30,514	31,000	T-651B	Non-RCRA Oily Water	Center West
T-652	Used Oil	9,158	10,000	T-652	Non-RCRA Oily Water	West
T-705A	Treated Wastewater	6,624	7,000	---	---	Center
T-705B	Treated Wastewater	6,624	7,000	---	---	Center
T-705C	Treated Wastewater	6,624	7,000	---	---	Center East
T-706	Treated Wastewater		12,000	---	---	Center

Tank Usage Notes:

General Note: Tank numbers are generally grouped by designated use, both in the existing and the proposed facility. When the facility is expanded, the designated use of several tanks will change, necessitating the renumbering of the tanks. A description of the changes is provided below. Tanks which will be converted from non-hazardous usage to storage of hazardous wastes will be certified for hazardous waste usage in accordance with 22 CCR 66464.192 prior to use for hazardous waste storage.

The following tanks will change service:

- 1 – T-501C now stores halogenated RCRA fuel with the new permit it will store RCRA Fuels
- 2 – Tanks T-506 A & C will change from non-hazardous to hazardous service.
- 3 - Tanks 705 A/B/C and Tank T-706 stores non-hazardous water and will be removed with the new project.

In 1986 shortly after Evergreen plant startup, there was a fire in one of the asphalt flux storage tanks, Tank T-511B. This was caused by filling the asphalt flux tank from the top with hot material. The static electricity generated by this filling method resulted in an electrical discharge. Because the asphalt flux fed into the tank was hot, it generated enough vapors for the electrical discharge to start a fire. This was corrected

immediately by changing the piping to fill the tank from the bottom and adding a cooler to the pipeline to lower the temperature of the material entering the tank. The current tank has been in operation for 15 years without further incidents.

Currently, the hazardous waste tanks receive used oil and non-RCRA contaminated petroleum products that meet the definition in Section 25250. (1)(a)(7)(A) of the H&SC, from offsite sources. Waste is received from trucks parked in the east loading/unloading area. The tanks are aboveground cylindrical steel tanks with a shallow cone roof and flat bottom. The tank operates at atmospheric temperature and pressure. The tanks are installed within a containment structure. The tank farm containment dimensions are 209 feet long and 140 feet wide and 3 feet high containment wall. It is subdivided to smaller containment areas. Sump Tank X-508 is located northwest of the tank farm area to collect liquids from the tank overflow lines.

5.1.1.2 Sump Tank X-508

Sump Tank X-508 has a capacity of 1,200 gallons and was put into service in 1986. It is located in a concrete containment vault with the dimension of 12' length by 8'7" width by 10'6" depth which has a sufficient capacity to meet the secondary containment requirements. Sump Tank X-508 is located in the northwest corner of the tank farm and is identified on the facility map located in Attachment A. It collects liquids from the tank overflow lines located in the tank farm. The overflow lines are underground double walled lines and have the potential to carry lube oil, used oil, recycled oil, oily water, halogenated fuel and waste antifreeze. If material accumulates in Sump Tank X-508, it will be pumped out using a vacuum truck, and the material will be placed in appropriate holding tank. Additional information pertaining to Sump Tank X-508 can be found in Attachment F.

Release Controls

The area is paved with concrete and has a secondary containment structures.

History of Releases

Possible spills over a number of years based on inadequate operational procedures, broken valves and equipments.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because the spills are over concrete, and there are network of cracks. The potential for releases may increase due to the spills over time which may have impacted the concrete.

Surface Water: The Tank Farm has a secondary containment structures. Therefore,

the potential for surface water contamination is low.

Air: Releases in the air result from equipment break-up, operator's mistakes, fugitive emissions and spills. Factors which influence contaminants in the air include wind, air temperature, break-ups, inversions and activities stirring up waste contaminated material. Warmer temperatures can increase volatile constituent releases to air. The migration for air is primarily downwind from a contaminant source. Accidental releases from the Evergreen plant have resulted in odors outside the plant. Section 3.2 of the RFA lists the actions that Evergreen has taken to minimize odor problems and Section 4.4 is a summary of some of the odor problems at Evergreen Oil facility. Evergreen has installed Vapor Recovery System on all hazardous waste tanks in the tank farm. However, there is a potential of breakdown. Based on the operational aspects of this SWMU and the odor problems, potential air releases are moderate.

5.1.2. SWMU No. 2 - Process Area

The SWMU No. 2 consists of two sub units, re-refinery and Mohawk treatment system.

5.1.2.1 Re-refinery

Evergreen Oil, Inc. is a facility that re-refines used oil/recycled oil into base lube oil. Processes that are also employed during the re-refining process to upgrade the recycled oil include: vacuum dewatering, vacuum distillation, hydrotreating and fractionation. These remaining processes are located in area labeled as the process area on the facility map, see Attachment A. Before the expansion, an average of 11 million gallons of recycled oil is re-refined each year by Evergreen Oil, Inc. The entire process area is built on a concrete slab that is surrounded by a 6-inch high concrete berm that serves to contain all liquids from escaping from this area. Liquids that accumulate in this area drain to Sump Tanks X-453/454. The equipment is mounted within concrete containment. A detention sump is located northwest of the process area to contain wash water generated during the refinery shutdown and storm water. The process unit description of the existing refinery section can be found in Attachment F (see also Part B Permit Application, Attachment IV-5-4). The following Table 5.4 lists the re-refinery equipments

**Table 5.4
EQUIPMENT LIST
RE-REFINING SECTION**

<u>Number</u>	<u>Description</u>
P503	Feed Pump

R95	Mohawk Reactor
P91	Mohawk Re-circulation Pump
E101	Mohawk Recycle Heat Exchanger
E95	Mohawk Recycle Heat Exchanger
V101	Dewatering Drum
C101	Gas Oil Column
E103	RGO Cooling Exchanger
P101	Degas Oiled Lube Pump
F101	Degas Oiled Lube Filter
E102	Degas Oiled Heat Exchanger
R102	Hot Soak Reactor
P401	Vacuum Column Feed Pump
C201	Vacuum Column
E104	Preheat Exchanger for Vacuum Column
P201	Lube Distillate Re-circulation Pump
E201	Lube Distillate Cooling Exchanger
A201	Lube Distillate Fin Fan
V202	Lube Distillate Surge Vessel
P301	Backend Feed Pump
V201	Asphalt Surge Drum
P202	Asphalt Pumps to Storage Tanks
A101	Dewatering Overhead Cooling Fin Fan
HA401	Knockout Pot
V701	Oil/Water Separator
V401	Light End Storage Vessel
C701	Stripping Column
V424	Condensate Holding Vessel

5.1.2.2 Mohawk Treatment

As listed above, Mohawk Treatment System is a portion of the re-refining process which is a proprietary process, and constitutes the addition of sodium hydroxide to the used oil to prevent piping and equipment fouling. The Mohawk Treatment System is located in the process area of the facility and consists of one 950-gallon tank, R-95, and associated pumps, piping and heat exchangers. In May 2002, Mohawk treatment unit received a state permit as part of the Class 3 Permit Modification.

The sodium hydroxide and the used oil are circulated and mixed through a series of vessels and heat exchangers before it is pumped to the next step of processing. Sodium Hydroxide addition varies and it would approximately 0.09 pound per pound of used oil.

Release Controls

The process area which includes Re-refinery and Mohawk treatment is paved with concrete.

History of Releases

Possible spills over a number of years based on inadequate operational procedures, broken valves and equipments.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because the spills are over concrete, and there are network of cracks. There are a number of sumps and underground trenches and piping connecting the sumps to Detention Sump 1 which may increase the potential for releases. The potential for releases may also increase due to the constant spills over time which may have impacted the concrete.

Surface Water: The area drains to Sump Tanks 453/454 and the Detention Sump 1. The potential for surface water contamination is moderate in case of a heavy storm due to the size of the area.

Air: Releases in the air result from equipment break-up, operator's mistakes, fugitive emissions and spills. Factors which influence contaminants in the air include wind, air temperature, break-ups, inversions and activities stirring up waste contaminated material. Warmer temperatures can increase volatile constituent releases to air. The migration for air is primarily downwind from a contaminant source. Accidental releases from the Evergreen plant have resulted in odor complaints outside the plant. Section 3.2 of the RFA lists the actions that Evergreen has taken to minimize odor problems and Section 4.4 is a summary of some of the odor problems at Evergreen Oil facility. Based on the operational aspects of this SWMU and the odor problems, potential air releases are moderate.

5.1.3- SWMU No. 3 - Wastewater Treatment Area – DAF Area

The SWMU No. 3 consists of two sub units, Wastewater Treatment Systems (DAF) and treated wastewater tanks T-704A and T-704B.

5.1.3.1 Wastewater Treatment System – DAF (old and new)

The current wastewater treatment system (referred to as DAF) consists of a dissolved air floatation system, chlorine dioxide generator, and carbon polishing. The wastewater treatment system is currently only used to treat non-hazardous wastewater. The DAF is designed and permitted by the local air district to operate at a maximum capacity of 40 gpm. It is primarily used to treat

wastewater from the re-refining of used oil and wash water from facility cleaning operations. After receiving the permit, DAF will be authorized to treat oily water hazardous waste. The current DAF that is in place and being used was installed in August 2000. Located adjacent to the current DAF is the previous wastewater treatment system that is no longer used. The previous wastewater treatment system was used to treat both non-hazardous and hazardous oil and water mixtures. A process description and more detailed information pertaining to the DAF can be found in Attachment F (see part B equipment list). The location of the DAF wastewater treatment system can be found on the facility layout located in Attachment A.

5.1.3.2 Treated Wastewater Tanks T-704A and T-704B

Tanks T-704A and T-704B are part of the DAF wastewater treatment system and are storing treated non-hazardous wastewater from DAF unit and are located in the DAF area right outside the southeast of the tank farm. The following Table 5.6 shows the tanks and sizes.

Table 5.6

Existing Tank Number	Existing Contents/Usage	Useable Capacity (Gal.)	Total Capacity (Gal.)	Proposed Tank Number	Proposed Contents/Usage	Location in the Tank Farm
T-704A	Treated Wastewater	6,650	7,000	T-704A	Treated Wastewater (WTS-DAF)	Outside Tank Farm South East
T-704B	Treated Wastewater	5,890	6,200	T-704B	Treated Wastewater (WTS-DAF)	Outside Tank Farm South East

Release Controls

The area is paved with concrete.

History of Releases

Possible spills over a number of years based on inadequate operational procedures or equipment failures.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because the spills are over concrete, and there are network of cracks. The potential for releases may increase due to the constant spills over time which may have impacted the concrete.

Surface Water: There is a drainage point on the west of DAF unit to discharge treated wastewater to USD. The wastewater is tested and then discharged to this outlet. The potential for surface water contamination is moderate because of inadequate secondary containment.

Air: Currently, there is a vapor recovery system on the new DAF unit to minimize air emission. In 2004, EOI had one odor incident. The cause of the odor was leaks from wastewater treatment system (DAF) covers. The covers had small openings that did not seal the process vessels tightly. Evergreen has mitigated the problem by modifying and installing new equipments. Based on the operational aspects of this unit and the past incidents, potential air releases are moderate.

5.1.4- SWMU No. 4 - WEST LOADING/UNLOADING AREA

The west loading/unloading is located west side of the facility, adjacent to the Tank Farm and is comprised of two separate sub areas:

The existing Bobtail Truck Loading/Unloading area, which measures approximately 40 feet by 100 feet, and the Transport Truck Loading/Unloading area which measures approximately 50 feet by 80 feet. Before the expansion, an average of 13 million gallons of used oil, 1.5 million gallons of oily water mixtures, and 600,000 gallons of antifreeze are offloaded from vehicles in these two areas per year. An average of 1.4 million gallons of asphalt, 3.6 million gallons of recycled fuel oil, and 5.3 million gallons of lube oil are loaded in the transport area. Further detailed information about these two loading areas can be found in Attachment F.

5.1.4.1- Bobtail Truck Loading/Unloading Area

The bobtail loading/unloading area is used for the offloading of collection trucks and vacuum trucks. Hazardous wastes that are offloaded in this area include used oil, waste antifreeze, and oil and water mixtures. Trucks are parked in the area and waste is transferred using hose connections to the tank farm pumping system and pumps, or the pumps on board the trucks. Material is transferred to receiving tanks. Waste and product liquids are also transferred to trucks from the tank farm tanks while parked in the area. This area is able to accommodate up six vehicles at one time. The area is provided with secondary containment in the form of a concrete slab that slopes toward containment drains that drain into Sump Tank X-510. In the event that the capacity of Sump Tank X-510 is exceeded, Sump Tank X-510 is designed to overflow into a 20,000-gallon emergency spill containment sump located adjacent to sump tank X-510. If liquid overflows into the emergency spill containment sump, it will be emptied as soon as possible. This sub-area is covered with an open-sided roof structure. Grounding and bonding devices are provided. The bobtail unloading area is

identified on the facility map located in Attachment A.

5.1.4.2 - Transport Truck Loading/Unloading Area

The transport loading/unloading area is located adjacent to the bobtail unloading area, west of the tank farm, see Attachment A. The transport area measures approximately 50 feet by 80 feet and is able to accommodate two trucks at one time. The waste materials that are handled in this area include used oil, waste antifreeze, and oil and water mixtures. In addition, the following product materials are also loaded in this area: lube oil, fuel oil, and asphalt. The area is paved with concrete and is provided with a spill control drainage system which drains to 20,000-gallon Detention Sump 2 located adjacent to Sump Tank X-510. The transport truck sub-area is equipped with overhead loading arms for transferring products and low volatility waste. The sub-area is covered an open-sided roof structure. Grounding and bonding devices are provided. The transport sub-area will accept two semi-trailer trucks.

Release Controls

The area is paved with concrete.

History of Releases

Possible spills over a number of years based on inadequate operational procedures. Investigation of the area revealed that every tanker truck has the potential for leaking or spilling oil each time hookup to truck valving is initiated.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because the spills are over concrete, and there are network of cracks. The potential for releases may increase due to the constant spills over time which may have degraded the asphalt and the concrete.

Surface Water: The drainage and trenches do not appear to be able to handle a big storm. Therefore the potential for surface water contamination is moderate.

Air: There have been a number of odor complaints in the past from this area due to operator's mistakes or equipment breakdown which has resulted in odor releases. Evergreen has installed a vapor recovery system in the truck loading/unloading area to minimize air emission. Based on the operational aspects of this unit, potential air releases are moderate.

5.1.5- SWMU No. 5 - Filter Wash Area

A filter wash area is located adjacent to the bobtail collection truck unloading area. The transfer line from the truck to the tanks has basket strainers to catch the solids. When the basket is full of solids it will be removed from service and cleaned in the Bobtail filter cleaning area. The bobtail collection trucks also contain filter baskets to prevent solids from being pumped into the truck tank. Filter baskets from the bobtail trucks will also be emptied and cleaned in the filter wash area. Solids from the filter baskets are emptied into a 55-gallon drum. The filter wash area has concrete floor and is 10 feet by 10.5 feet area and contained within 43.5 inch high concrete wall.

Release Controls

The area is paved with concrete.

History of Releases

Possible spills over a number of years based on inadequate operational procedures or equipment failures. Observations during the VSI indicate ongoing spills or leaks have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because the spills are over concrete, and there are some cracks. The potential for releases may increase due to the constant spills over time which may have impacted the concrete.

Surface Water: No surface water or storm drainage was observed in the immediate area. Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.1.6- SWMU No. 6 - Sump Tank X-510

Sump Tank X-510 has a capacity of 900 gallons and was put into service in 1986. The sump is located between the transport and bobtail loading area in a concrete containment vault with a dimension of L 8'6" x W 9' x D 11' that has sufficient capacity to meet the secondary containment requirements. Sump Tank X-510 is used to collect spills from the bobtail and transfer loading/unloading area and filter wash area. In addition, it is also used to collect wash water, consisting primarily of water with low concentrations of oil, from the cleaning of the vehicle loading/unloading areas, washing maintenance shop

floors and oily water discharges from the sinks located in the Evergreen laboratory as a result of washing oily dishes and hands. Sump Tank X-510 contents are pumped to Sump Tank X-453. In the event that the capacity of Sump Tank X-510 is exceeded, Sump Tank X-510 is designed to overflow into a 20,000-gallon Detention Sump 2 located adjacent to Sump Tank X-510. Sump Tank X-510's location is identified on the facility map located in Attachment A. The process unit description of Sump Tank X-510 is in Attachment F (see Part B, Attach IV-5-4).

Release Controls

The sump area has concrete walls and it has a Sump Tank in it. The releases from different areas of the facility are drained to this tank via underground pipes.

History of Releases

Possible spills over a number of years based on inadequate operational procedures and or equipment failure. Ongoing spills or leaks may have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of the spills and a network of cracks on the concrete surface. The potential for releases may increase due to the spills over time and inability to observe the bottom of the sump which may have impacted the concrete.

Surface Water: No surface water or storm drainage was observed in the immediate area. Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Spills from different areas of the facility is directed to this unit. Based on the operational aspects of this unit, potential air releases is currently low however after the expansion it may be moderate due to changes in incoming and outgoing waste.

5.1.7- SWMU No. 7 - Detention Sump 2

The Detention Sump 2 is located between Transport loading/unloading Area and the Tank Farm next to the Sump Tank X-510. In the event that the capacity of Sump Tank X-510 is exceeded, sump tank X-510 is designed to overflow into the Detention Sump 2, a 20,000-gallon spill containment sump. Bobtail area and Transport Loading/Unloading Area spills drains to Sump Tank X-510. The Detention Sump 2 has concrete walls and floor and its size is 12 feet wide by 20 feet length by 11'2" feet depth. The Detention Sump 2's location is identified on the facility map located in Attachment A. Additional information pertaining to the Detention Sump 2 can be found in Attachment F.

Release Controls

The sump area has concrete walls. The releases from different areas of the facility are drained to this unit via underground pipe from Sump Tank X-510.

History of Releases

Possible spills over a number of years based on inadequate operational procedures and or equipment failure.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of the spills and a network of cracks on the concrete surface. The potential for releases may increase due to the spills over time and inability to observe the bottom of the sump which may have impacted the concrete.

Surface Water: No surface water or storm drainage was observed in the immediate area. Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Spills from different areas of the facility is directed to this unit. Based on the operational aspects of this unit, potential air releases is currently low however after the expansion it may be moderate due to changes in incoming and outgoing waste.

5.1.8- SWMU No. 8 - Pumping and Valve Station West Tank Farm

Unit Characteristics

Tank Farm West Pumping Station consists of the pumping and valving area for the tank Farm, and is located in the west of Tank Farm. Oil spills from the pumping/piping/valving have heavily stained the concrete, and the drains are sloped so that spills would enter these drains to the Sump Tank X-453. The Tank Farm West Pumping Station location is identified on the facility map located in Attachment A.

Release Controls

The floors are concrete. Drains are sloped to collect spills and leaks from runoff.

History of Releases

No releases to these drains are documented. However, observations during the VSI indicate ongoing spills or leaks have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for contamination to soil and groundwater is moderate because leaks or spills would probably impact the soil or groundwater through concrete cracks.

Surface Water: Leaks and spills would not directly enter the storm drainage system. The potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.1.9- SWMU No. 9 - Pumping and Valve Station South Tank Farm

Unit Characteristics

Tank Farm South Pumping Station consists of the pumping and valving area for the tank Farm, and is located in the south of Tank Farm. Oil spills from the pumping/piping/valving have heavily stained the concrete, and the drains are sloped so that spills would enter the Sump Tank X-453. The Tank Farm South Pumping Station location is identified on the facility map located in Attachment A.

Release Controls

The floors are concrete. Drains are sloped to collect spills and leaks from runoff.

History of Releases

No releases to these drains are documented. However, observations during the VSI indicate ongoing spills or leaks have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for contamination to soil and groundwater is moderate because leaks or spills would probably enter the drainage system and may also impact the soil or groundwater through concrete cracks.

Surface Water: Leaks and spills would not directly enter the storm drainage system. The potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.1.10 - SWMU No. 10 - Pumping and Valve Station East Tank Farm

Unit Characteristics

Tank Farm East Pumping Station consists of a pump and valve area for the tank Farm, and is located in the east of Tank Farm. Oil spills from the pumping/piping/valving have stained the concrete, and the drains are sloped so that spills would enter these drains. The Tank Farm East Pumping Station location is identified on the facility map located in Attachment A.

Waste Managed

Oil leaks and spills.

Release Controls

The floors are concrete. Drains are sloped to collect spills and leaks from runoff.

History of Releases

No releases to these drains are documented. However, observations during the VSI indicates ongoing spills or leaks have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for contamination to soil and groundwater is moderate because leaks or spills would probably impact the soil or groundwater through concrete cracks.

Surface Water: Leaks and spills would not directly enter the storm drainage system. The potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.1.11- SWMU No. 11 - Sump Tanks 453/454 Area

This SWMU consist of two sub units next to each other.

5.1.11.1- Sump Tank 453

5.1.11.2- Sump Tank 454

The entire process area is built on a concrete slab that is surrounded by a 6-inch concrete berm that serves to contain all liquids from escaping from this area.

Storm water, spills and wash water from this area drain to Sump Tanks X-453/454. Sump Tank X-453 is used as an oil water separator and has a capacity of 1,240 gallons. Sump Tanks X-453/454 went into service in 1986 and is located in a concrete containment vault that has a sufficient capacity to meet all secondary containment requirements. Sump Tanks X-453/454 is located near the northwest corner of the tank farm and is identified on the facility map located in Attachment A. In addition to Sump Tank X-510, liquids from the drains in the contained areas of the tank farm and re-refinery process area drain to Sump Tanks X-453/454. These liquids primarily consist of water with low concentrations of oil generated during cleaning operations and storm water. Sump Tank X-453 is designed to separate the oil from the water with the oil being pumped to Tank 502 and the wastewater being pumped to Tank 651A. Sump Tanks X-453 and X-454 are made of fiberglass structure and are installed below grade in an open concrete sump with the dimension W18' x L 16'7" x D 11' for containment. X-454 is W 9'3" x H 6' x L 10'6" (4360 gallons) and X-453 is W 4'3" x H 4'6" x L 12'7" (1800 gallons). The tanks are sitting on wooden blocks above the floor of the concrete sump. The throughput of the sumps is about 2000 gallons a day. Sump Tank X-454 receives storm and wash water from the refinery process area and the tank farm. The storm and wash water from the process and tank farm containment areas gravity flow to the sump tanks. The water from Sump Tank X-454 is pumped to T-651A. The process description for Sump Tanks X-453/454 is in Attachment F.

Release Controls

The sump area has concrete walls and it has a Sump Tanks X-453 and X-454 in it. The releases from different areas of the facility are drained to this unit via underground pipes, ditches or trenches.

History of Releases

Possible spills over a number of years based on inadequate operational procedures and or equipment failure. Ongoing spills or leaks may have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of the spills and a network of cracks on the concrete surface. The potential for releases may increase due to the spills over time and inability to observe the bottom of the sump which may have impacted the concrete.

Surface Water: No surface water or storm drainage was observed in the immediate area. Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Spills from different areas of the facility is directed to this unit. Sump Tanks 453 and 454 are connected to 55 gallons activated carbon drum to capture air emissions. Based on the operational aspects of this unit, potential air releases is currently low however after the expansion it may be moderate due to changes in incoming and outgoing waste.

5.1.12- SWMU No. 12 - Detention Sump 1

Detention Sump 1 is a 21,400 gallon cast in place concrete sump with the dimension 20 feet width by 22 feet length by 6.5 feet high with the floor sloping to a small drainage/dewatering sump. A water stop is embedded in the concrete at construction joint between the bottom slab and walls to prevent passage of fluid through the joint. The sump is designed to contain the storm water, wash water, spills and oil/water mixtures releases from re-refinery process area before it is pumped out.

Release Controls

The sump area has concrete walls. The releases from different areas of the facility are drained to this unit via underground pipes, ditches or trenches.

History of Releases

Possible spills over a number of years based on inadequate operational procedures and or equipment failure. Ongoing spills or leaks may have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of the spills and a network of cracks on the concrete surface. The potential for releases may increase due to the spills over time and inability to observe the bottom of the sump which may have impacted the concrete.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Spills from different areas of the facility is directed to this unit. Based on the operational aspects of this unit, potential air releases are low.

5.1.13- SWMU No. 13 - Ten Day Transfer Station Area

Evergreen has used the transfer facility exemption of 22 CCR §66263.18 to transfer drummed materials from one vehicle to another for transfer to an off-site disposal facility. Containers are kept at Evergreen for fewer than 10 days and are not opened or repackaged once they arrive at the Evergreen Oil, Inc. facility.

Containers transferred in this area included primarily debris contaminated with oil (Non-RCRA) and Non-RCRA liquids such as waste antifreeze and oily water mixtures. In addition, other materials that may be handled in this area include flammable/combustible liquids (i.e. gasoline mixtures, diesel fuel mixtures and oil contaminated with halogens) and corrosive liquids. On rare occasions, materials that are classified as hazardous divisions 2.1, 5.1, 6.1, 4.1, 4.2, 4.3 by the Department of Transportation may be transferred in this area. This transfer station area is approximately 8 feet wide and 45 feet long. It is located in the northwest section of the facility and is identified on the facility map, located in Attachment A, as 10-Day Transfer Area. The area is covered with asphalt with no secondary containment.

Release Controls

The area is paved with asphalt.

History of Releases

Possible spills over a number of years based on inadequate operational procedures or drum leaks

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is low because drums were kept in the trucks and spills over asphalt. The potential for releases may increase due to the spills over time which may have degraded the asphalt.

Surface Water: There are no drainage and trenches at the area. The material were kept in drums and shipped out within 10 days. Based on the operational aspects of this unit, potential air releases are moderate.

Air: The drums were kept closed at all times. Based on the operational aspects of this unit, potential air releases are low.

5.1.14- SWMU No. 14 - Railcar loading area 1

The railcar loading area is located on the south side of the facility and is shown on the facility map in Attachment A. The railcar loading area is used for the loading of lube oil. On rare occasions, recycled fuel oil may also be loaded in this area. The railcar area is used to load an average of 3.5 million gallons of lube oil per year. Containment pans are located under the railcar at all times. Personnel are present at all times to monitor all loading and unloading operations and no vehicle is left unattended during loading or unloading operations.

Release Controls

Containment pans are located under the railcar at all times.

History of Releases

Possible spills over a number of years based on inadequate operational procedures. A file review revealed that there was an oil spill on September 14, 1995 due to improper closing of a loading valve. The contaminated gravel was removed and disposed off site and the area backfilled with clean gravel.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of the past spills.

Surface Water: Personnel are present at all times to monitor all loading and unloading operations and no vehicle is left unattended during loading or unloading operations. The potential for surface water contamination is moderate due to inadequate secondary containment capacity. The expanded facility will provide adequate secondary containment.

Air: There have been a number of releases in the past due to operator's mistakes or equipment breakdown which has resulted in odor releases. Evergreen will be installing a vapor recovery system for loading/unloading to minimize air emission. Based on the operational aspects of this unit, potential air releases is moderate.

5.1.15 SWMU No. 15 - Underground Piping, Ditches, Trenches and Catch Basins

There are a network of underground piping, ditches and trenches connecting small sumps in process area, treatment area, and/or storage area to Tanks X-508, X-510, X-453, X-454, Detention Sumps 1 and Detention Sump 2. Figure IV-S-D-1 shows the network. The detailed information for size and material of construction is shown in a figure in Attachment A. This underground network transport spills, wash water and oily water to Sumps listed above.

Release Controls

The releases from different areas of the facility are carried by this underground network to Sump Tanks and Detention Sumps.

History of Releases

Possible leaks over a number of years based on inadequate leak detection programs and equipment failure. Ongoing spills or leaks may have occurred.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is moderate because of piping leaks and corrosion and the absence of a leak detection program. The potential for releases may increase due to the leaks over time and inability to observe or inspect which may have impacted the soil and the groundwater.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Spills from different areas of the facility is directed to this unit. Based on the operational aspects of this unit, potential air releases are low.

5.2 - Areas of Concern

AOC No. 1-Above Ground Raw Material Product tanks

AOC No. 2- Main Plant Storm Water Outfall

AOC No. 3- Union Sanitation District Discharges

AOC No. 4- Maintenance Shop

AOC No. 5- Laboratory

5.2.1- AOC No. 1 - Above Ground Raw Material Product Storage Tanks

Evergreen uses above ground tanks for the storage of raw product materials. The tanks hold materials ranging from sodium chlorite, sodium hypochlorite, and hydrochloric acid for wastewater treatment to sodium hydroxide and hydrogen for the re-refining process. The following Table 5.7 is a listing of these tanks and detailed information. The location of each tank is identified on the facility map in Attachment A. Material data sheets for the materials stored in the tanks can be found in Attachment E. These tanks are located at different areas of the facility and are mostly adjacent to the SWMUs that they serve. Any releases from these tanks may be investigated part of the SWMUs area that they are located.

Table 5.7

Tank Number	Capacity (gallons)	Dimensions (feet)		Installation Date	Material Stored Currently/Previously	Hazardous
		Diameter	Height			
Caustic	5000	9	10	1986	Sodium Hydroxide	Yes
730	2500	6	5	1990	Hydrochloric Acid	Yes
731	2500	7	6	1990	Sodium Hypochlorite	Yes
732	3800	8	15	1990	Sodium Chlorite	Yes
617	950	5	7	1990	Hydrochloric Acid	Yes
614	950	6	6	1990	Sodium Hypochlorite	Yes
X-610	6000			1986	Hydrogen	Yes
Nitrogen Tank	2400			1997	Nitrogen	Yes

Release Controls

The area is paved with concrete and has a secondary containment structures.

History of Releases

Possible spills over a number of years based on inadequate operational procedures, broken valves and equipments.

Pollutant Migration Pathways

Soil and Groundwater: The potential for impact to soil and groundwater is low because the spills if any are over concrete.

Surface Water: The raw material tanks have small capacity and are monitored by the employees. Therefore, the potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.2.2 AOC No. 2 - Main Plant Storm Water Outfall and the Flood Control Channel

In 1988, a storm line containing oily water overflowed during a large storm event. This resulted in a discharge of oil into the flood control channel. Evergreen cleaned up the oil with oversight by the Newark Fire Department using on site emergency response equipment. An inflatable plug was installed in the main plant storm water outfall to the flood control channel to prevent accidental

discharge of storm water.

Another release that occurred at the facility occurred on March 30, 1996. The incident involved a spill of oily water into the flood control channel that runs adjacent to the Evergreen facility. It is estimated that 224 gallons of oily water was spilled in the storm drain during the a material transfer, but that only 45 gallons of oily water made its way to the flood control channel and of that, approximately six gallons was oil. The remaining spilled material was trapped behind an inflatable plug that was installed in the outfall line to the flood control channel. The spill was cleaned up under the supervision of the California Department of Fish and Game. Booms were placed across the flood control channel and pockets of oil that had accumulated in the flood control channel were removed using an Evergreen vacuum truck. The shoreline was rinsed with water and absorbent pads were used to clean up oil along the shoreline. The storm drain leading to the flood control channel was thoroughly rinsed and the rinseate was removed using an Evergreen vacuum truck.

On April 2, 1996, a slight sheen was detected on water discharged to the flood control channel which consisted of traces of the oily water accidentally discharged on March 30, 1996. To mitigate further incidents such as this, inspection of the inflatable plug was increased from once a week to daily.

Release Controls

An inflatable plug has been installed in the outfall line to the flood control channel to control the releases.

History of Releases

The history of releases is presented in the above table.

Pollutant Migration Pathways

Soil and Groundwater: Storm water is discharged to this unit. Based on the operational aspects of this unit, potential for soil and groundwater contamination is low.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is moderate.

Air: Based on the operational aspects of this unit, potential air releases are low.

5.2.3 AOC No. 3 -Discharges to the Union Sanitation District (USD) – Lift Station

Evergreen is permitted to discharge the treated wastewater from DAF unit to the USD at the Lift Station right next to the DAF unit under a permit from Union Sanitation District. There have been a number of discharges to USD that has resulted in violation of industrial wastewater regulations. On June 2002 Evergreen switched from continuous to batch treatment for treating the non-hazardous oily wastewater at the facility and thus improving the compliance with USD. The following Table 5.8 shows the date, location, the kind of violation and the corrective measures taken.

Table 5.8
EVERGREEN OIL, INC./USD VIOLATIONS

Date of Violation	Area	Violation of Industrial Waste Regulation	Action Taken
8/28/2003	Manhole behind Loading Station	Foaming Problems.	Every batch* tank is tested for foam prior to discharge. If the test reveals a potential for the batch tank to foam, anti-foam agent is injected to the treated wastewater.
8/28/2003	Lift Station	Failure to inform USD about a blocked discharge line that has been bypassed.	The line was unplugged and Evergreen employees have been trained on the notification procedure
1/22/2003	FAC	A sample collected by USD from Evergreen Oil resulted in a violation for the local limits for Phenols.	Increased the frequency of phenols testing
12/28/2000	Lift Station	Arsenic exceeded local discharge limits.	A contaminated carbon bed was suspected to be the cause, and it was replaced.
12/20/2000	Lift Station	Zinc and Arsenic levels exceeded local discharge limits.	The source was zinc from the cooling tower water More corrosion inhibitors were added
5/21/1999	FAC	Ammonia levels exceeded local discharge limits.	Re-calibrated pH probes and increased the frequency of Ammonia sampling and testing
5/25/1999	Lift Station	Cyanide exceedance levels	Tested Hot Well found high level of cyanide.

Date of Violation	Area	Violation of Industrial Waste Regulation	Action Taken
			More samples were taken at various sources and were analyzed for cyanide.
5/13/1999	Lift Station	Cyanide exceedance levels.	Tested stream stripper and found high level of cyanide. Water was re-tested and met the limit.
5/4/1999	Lift Station	Cyanide exceedance levels	Same as above
3/23/1999	FAC	A sample was taken by USD and the total cyanide level exceeded the local discharge limits.	Chlorine might be interfering with the preservation procedures. More additional grab samples were taken for cyanide testing.
4/13/1999	Lift Station	Low pH levels at the grab self monitoring sample.	The lift pump that the pH alarm is wired to was non-operational. The lift pump was repaired later.
1/7/1999	FAC	A sample was taken by USD and the Ammonia Concentration exceeded the local discharge specifications.	The amount of chemical added to boiler was reduced because it is amine based and can cause high Ammonia levels.
12/1/1998	FAC	Cyanide exceedance levels	Increase the frequency of cyanide testing to one a month. The cause might be chlorine interference with the Lab. analysis.
10/13/1998	FAC	Cyanide exceedance levels	" Same as Above"
11/25/1998	Lift Station	Phenols level the local discharge limits during the self-monitoring monthly analysis.	Operators started increasing the level of Chlorine Dioxide or decreasing the flow to the generator when Phenol approaches 5 ppm.
2/3/1998	Lift Station	Scheduled self-monitoring lift grab revealed a TTO	Steam stripper was down for repairs and

Date of Violation	Area	Violation of Industrial Waste Regulation (Total Toxic Organic) level which exceeded the USD	Action Taken
		local discharge limits.	the subsequent overloading of the carbon canister. Steam stripper later was put in service.
9/23/1997	Lift Station	Scheduled self-monitoring lift grab revealed a TTO (Total Toxic Organic) level which exceeded the USD local discharge limits.	Steam stripper was repaired and put on line. When steam stripper is down Hydrogen Sulfide levels are monitored in the wastewater.
9/2/1997	FAC	A sample was collected by USD and the Zinc level exceeded the USD local discharge limits.	DAF was not working properly during the day of violation (high Oil and low pH levels). Laboratory will inform operations of Oil & Grease is above 50 ppm.
8/21/1997	Lift Station	Scheduled self-monitoring lift grab revealed a Zinc level above the USD discharge limits.	During shut down procedures the water from the cooling tower will be tested for metals prior to discharge.
5/8/1995	Lift Station	Evergreen Oil experienced a high level of Zinc in the wastewater discharge due to low pH.	pH in the DAF was much lower than usual. Evergreen has installed a pH alarm on the DAF influent. The alarm will alert operators to low or high pH levels.

Release Controls

The releases from different areas of the facility are carried by this underground network to Union Sanitation District sewer connections.

History of Releases

The history of releases is presented in the above table.

Pollutant Migration Pathways

Soil and Groundwater: Treated wastewater is discharged to this unit. Based on the operational aspects of this unit, potential for soil and groundwater contamination is low.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Treated wastewater is discharged to this unit. Based on the operational aspects of this unit, potential air releases are low.

5.2.4 AOC No. 4 - Maintenance Shop

Unit Characteristics

This unit is the Equipment Repair Shop. Leaking oil cans may have been stored on concrete. Wash water from the Maintenance Shop gravity flows to Sump Tank X-510 through a 4 inch pipe.. The Maintenance Shop has been moved out of the facility and the area has been cleaned.

Waste Managed

Lubricating oils and fuels.

Release Controls

Concrete Floor.

History of Releases

No information was available from the files researched. However, there is a possibility of past releases to the soils underlying the flooring .

Pollutant Migration Pathways

Soil and Groundwater: Contamination of soil and groundwater is unlikely unless seepage occurs through cracks in concrete. Based on the level of use, the potential for contamination is low.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, the potential for air releases is low.

5.2.5 AOC No. 5 – Laboratory

Evergreen has an on-site lab to finger print and analyze used oil waste or product streams received or shipped out. The used oil samples once analyzed are collected in a 55 gallon drum and later transferred to a used oil tank. Oily dishes are washed in the sink located in the laboratory which drains to the Sump Tank X-510. The lines to the Sump Tank X-510 should be investigated part of the underground pipe investigation.

Waste Managed

Used oil samples

Release Controls

Concrete Floor

History of Releases

No information was available from the files researched.

Pollutant Migration Pathways

Soil and Groundwater: Contamination of soil and groundwater is unlikely unless leakage occurs through underground line connecting the laboratory sink to Sump Tank X-510. Based on the operational aspects of this unit, the potential for soil and groundwater contamination is low.

Surface Water: Based on the operational aspects of this unit, the potential for surface water contamination is low.

Air: Based on the operational aspects of this unit, the potential for air releases is low.

6.0 VISUAL SITE INSPECTION

6.1. Purpose:

The purpose of the VSI is to assist identify releases at RCRA facilities in the corrective action program. The VSI will identify Solid Waste Management (SWMUs) and collect visual evidence of a release at facilities. The major goals of a VSI are:

- Visually inspect the entire facility for evidence that releases or potential releases of hazardous wastes or hazardous waste constituents have occurred, and identify Areas of Concern (AOCs);
- Ensure that all SWMUs and AOCs have been identified;
- Fill data gaps; and
- Focus on recommendations concerning the need for a sampling visit if is planned, interim measures, RCRA Facility Investigation (RFI), or no further action at a facility

6.2 Summary:

A VSI was conducted by DTSC project staff on January 27 and January 28, 2004. During the VSI photos were taken from suspected SWMUs and Areas of Concern where there were evidence of contamination. Copies of the photos are in Attachment D.

7.0 EXPOSURE PATHWAYS AND HUMAN AND ENVIRONMENTAL RECEPTORS

The purpose of this section is to discuss the potential for human and environmental receptors to be exposed to contaminants via media-specific migration pathways. This information will help determine the potential for releases from specific SWMUs that threaten human health or the environment and enable Cal-EPA, Department of Toxic Substances Control (DTSC) and EPA to set priorities for corrective action.

7.1 General Human and Environmental Receptors

Media of concern for this site include groundwater, soil, air, and surface water. Air pathway is the primary medium for potential human exposure to contaminant releases from the Evergreen facility. The report also indicated that there may be a potential for releases to air because equipment break-up, operator's mistakes, fugitive emissions, airborne contaminated soil/dust that has been stirred up by winds or human activity, or from volatile constituents that are released from the equipments, tanks, or spills.

There are numerous networks of cracks on the concrete or asphalt surfaces, so the potential for contamination to reach the groundwater is moderate. Depth to groundwater on-facility is approximately 8 to 10 feet. Surface concrete in few areas is heavily contaminated with oil, and has a potential to become airborne and affect nearby populations. Several areas of surface contamination are accessible to facility personnel, and may pose a threat in the event of direct contact. Since winds are predominantly from the west (onshore), surface soil/concrete contamination may reach the resident population.

Off-land use and activities include salt ponds; off-land recreational activities such as boating could potentially expose humans to any contaminants, which may have migrated into the bay area.

Evergreen Oil, established in 1985, is located on a 7-acre site is zoned MG (General Industrial) and is located within an urbanized area surrounded by industrial sites. Land use immediately surrounding the project site is not zoned for residential use; it is chiefly industrial and commercial. The site is surrounded to the west and south primarily by open land, salt ponds, wetlands and the Bay, but most of the project area to the north and east is suburban and zoned low-density residential.

The closest human receptors are employees of the surrounding business. A large truck terminal is located adjacent to the northern property. Other businesses include a pallet factory located to the southwest of the EOI facility at the end of Smith Avenue. A construction equipment distributor is located across Smith Avenue to the west of the EOI facility. Another truck terminal facility is located east of the EOI facility. The closest human receptors, other than EOI employees, would be the employees of the

truck terminal located approximately 125 feet north of the EOI northern boundary. The closest residential receptor is located approximately northeast of Cherry Street, approximately 1,400 feet north of the EOI facility.

7.2 Surface Migration Pathways and Receptors

Surface drainage occurs primarily by low-gradient overland flow. Surface water flows in response to seasonal and intermittent rainfall. Surface drainage occurs primarily by storm drainage to the channel and the San Francisco Bay. Surface drainage outside the facility boundaries does not enter the facility. Releases from the facility may have migrated to surface water and impacted local ecology. The flood control channel that runs adjacent to the Evergreen facility may have received releases in the past because the storm water runoff and any other drainage from the immediate area, via local storm drain connections. This water is ultimately discharged to the San Francisco Bay. Some ecological habitats which do exist along the Bay may have been impacted. There is a known record of an uncontrolled release from the facility impacting surface waters and currently, any surface releases and all storm water runoff is contained on site and treated at the facility. Other potential pathways for the migration of contaminants are trenches, sewer lines and buried pipelines.

Human Receptors

The flood control channel is not used for commercial fishing or shellfish gathering. Recreational activities, including pier fishing and boating, could expose individuals to contamination in the Bay.

Environmental Receptors

Species living or foraging in the Bay may be affected by release to surface water.

7.3 Soil Migration Pathways and Receptors

Soil or subsurface soil contamination may also be an intermediate pathway to other media, such as to groundwater via leaching or air via volatilization or wind erosion.

Human Receptors

Human receptors may be exposed to site contaminants in soil through dermal contact, inhalation and ingestion. Primary receptors would be facility workers in the area. Vehicles and pedestrian traffic would likely be exposed to a lesser degree. Construction and maintenance may also increase risks of human exposure to contaminants by uncovering contaminated soil areas.

Environmental Receptors

Environmental receptors may be exposed to directly in contact with the soil and animals feeding off the ground. Animal exposure can be through ingestion, dermal contact, and inhalation. During the VSI, no species were observed at the facility.

Contaminants may migrate from past spills, leaks or underground piping and trenches into the shallow groundwater and subsequently discharge into the flood control channel and/or Bay area. Contamination entering the food chain may affect all species, which live and feed in the Bay area.

7.4 Groundwater Migration Pathways and Receptors

The Evergreen plant is located within the Niles Cone sub-area of the South Bay Groundwater Basin. The uppermost aquifers in the Niles Cone sub-area are the Newark and Centerville-Fremont aquifers (EPA 1992). The Newark aquifer is an extensive gravel layer located between 60 and 140 feet below the ground surface. The Centerville-Fremont aquifer lies below this at between 180-200 feet and 310-340 feet, respectively (EPA 1992). Above the Newark aquifer is the Newark aquitard, which significantly impedes the downward flow of groundwater to the underlying aquifers.

The Newark aquifer is a main conductor of salt eastward from San Francisco Bay. The Alameda County Water District has a well located adjacent to the Evergreen property to extract groundwater and pump it back to the bay, reducing the intrusion of salt into the Newark aquifer. Water pumped from this well is discharged into the flood control channel on the west side of the Evergreen plant. According to information available from the Alameda County Water District (ACWD), the depth to the Newark aquifer at the facility site is approximately 12.5 feet. The facility is located at an elevation of approximately 21 feet above Mean Sea Level. Therefore groundwater is located approximately eight and half feet above Mean Sea Level. There are numerous networks of cracks on the concrete or asphalt surfaces. Surface concrete in few areas is heavily contaminated with oil. Groundwater contamination in the shallow groundwater is likely because of its shallow proximity to the surface. Migration of contaminants between the upper aquifers is possible depending on the vertical hydraulic gradient.

Human Receptors

Due to the proximity of the San Francisco Bay, to the south, the Newark aquifer has a chloride content of approximately 10,000 mg/l and is unfit for domestic uses. Salt water evaporation ponds are located about 900 feet southwest of the Evergreen Plant. There is no evidence of contamination at the ponds.

Environmental Receptors

Contaminants may migrate from past spills, leaks or underground lines into the shallow groundwater and subsequently discharge into flood control channel, ponds or San Francisco Bay. Species of marine life and birds may feed in the flood channel or San Francisco Bay. Contamination entering the food chain could affect all species which live and feed in the channel and Bay.

7.5 Air Migration Pathways and Receptors

Contaminants in the air result from equipment break-up, operator's mistakes, fugitive emissions, airborne contaminated soil/dust that has been stirred up by winds or human activity, or from volatile constituents that are released from the soil, open containers, or spills. Factors which influence contaminants in the air include wind, air temperature, break-ups, inversions and activities stirring up waste contaminated material. Warmer temperatures can increase volatile constituent releases to air. The migration for air is primarily downwind from a contaminant source.

SWMUs with the greatest potential for air release include waste storage and treatment units, re-refined oil spills, used oil and various volatile organic compounds. Many units at the facility generate wastes or products which have the potential to be released to the air either in vapor form or as particulate matter. Among others, vapor releases could come from re-refining, fuel blending, waste water treatment units.

Human Receptors

The primary potential human receptors are on-site workers and personnel, especially those engaged in activities near the containment source. Potential receptors also include those live near or downwind from the SWMUs. Although many may be indoors, they can be exposed if air contaminants are brought in through air ventilating systems, and are not being filtered adequately. An expansion to the facility may pose a threat for exposure of particulate contaminants, since the soils at these SWMUs maybe contaminated.

Environmental Receptors

Potential environmental receptors include most of the known species in the area that live or feed near, or downwind from the SWMUs at Evergreen.

8.0 POTENTIAL MIGRATION PATHWAYS

8.1. General

Air, soil and groundwater may have been impacted at the Facility by facility-related materials. Source areas include ASTs, re-refinery, sumps and underground pipes, ditches and trench lines. Contaminants may include various petroleum hydrocarbons from used oil, hydraulic oils, contaminated petroleum products and related breakdown products. The following sections present the physical properties and migration pathways of the potential constituents of concern (COC) at the Facility.

8.2. Physical Properties of Contaminants

As described above, potential COCs at the Facility are comprised of chlorinated and aromatic VOCs and various petroleum hydrocarbon formulations. Petroleum hydrocarbon products such as diesel, hydraulic fluid, motor oil, etc. are composed of hundreds of different compounds made up of hydrogen and carbon. The toxicity and mobility of these petroleum products is controlled primarily by the types and concentrations of aromatic compounds present. Aromatic hydrocarbons are subdivided into VOCs and SVOCs, (sometimes referred to as polynuclear aromatic hydrocarbons or PAHs). The more mobile volatile compounds are generally defined as those compounds with molecular weight less than 200 and a Henry's Constant (measure of volatility) of less than $0.00001 \text{ atm m}^3/\text{mole}$. Table 8.1 in the Attachment F presents a summary of the chemical and physical properties of significant COCs that may be detected in either soil or groundwater at the Facility.

Gasoline products are typically enriched in VOCs, primarily benzene, toluene, ethylbenzene and xylenes. These VOCs may be present only in trace amounts in heavier fuels such as jet fuel and diesel. In contrast, SVOCs constitute a relatively small fraction of gasoline but may be elevated in heavier fuels, particularly lower weight SVOCs such as naphthalene. VOCs and SVOCs are generally found in only trace amounts in heavier, less refined petroleum products such as hydraulic fluid and motor oil. The concentration of SVOCs is typically elevated in waste oils that have been submitted to high temperatures and pressures.

8.3. Behavior of Potential Contaminants in the Environment

Chemicals released to the environment may be present as free product, vapor-phase or dissolved-phase constituents in soil pores, or as constituents adsorbed to soil particles. Once released, a chemical may be dispersed and transformed

in soil and ground water by processes that include physical migration, sorption, hydrolysis, photochemical oxidation, and microbial degradation.

The ultimate fate and transport of a chemical is controlled by the total amount of the chemical present, the physio-chemical nature of the chemical and the physical and chemical properties of the impacted soil or sediment. Key physical and chemical properties of contaminants of potential concern at the subject site are summarized in Table 8.1.

Solubility, sorptive capacity and volatility are three parameters most useful in predicting a chemical's fate and transport in the environment. Solubility is described in terms of the ability of a chemical to become dissolved in water. Sorptive capacity and volatility are described in terms of soil organic matter/water partition coefficients (K_{oc}) and Henry's Law Constants, respectively. Compounds with relatively high solubilities (e.g., $>1,000$ mg/l) or Henry's Law Constants (e.g., $> 1 \times 10^{-5}$ atm-m³/mol) and low K_{oc} values (e.g., <1000) tend to be very mobile in the subsurface. Contaminants with high K_{oc} values and low solubilities tend to become bound to organic and particulate matter in soils and remain relatively immobile. The actual sorptive capacity of a compound depends on the texture of the soil and the nature of organic carbon in the soil and soil pore water.

Mobility of a chemical in the subsurface decreases with decreasing soil permeability. Migration is also controlled to a large extent by soil moisture. Increasing soil moisture, for example, inhibits upward migration of vapor. Upward migration of VOCs and emission at the ground surface into onsite buildings or the surrounding areas would be retarded by paved surfaces. Chemicals that reach the saturated zone would tend to move with the local groundwater flow pattern. Chemicals that are heavier than water (i.e. chlorinated VOCs) would tend to sink within the water column. Chemicals that are lighter than water (i.e. most aromatic VOCs) would tend to accumulate on the water table surface or become dissolved in a narrow zone below this surface.

Chlorinated Organic Compounds

Some of the Chlorinated organic compounds are noted in Table 8.1. As can be seen from the table, the compounds are characterized by relatively low K_{oc} values, moderate to high solubilities and moderate to high volatilities. These factors promote dissolved- and vapor-phase migration of the constituents in the vadose zone and the formation of dissolved-phase plumes in the ground water. Degradation rates of chlorinated compounds are typically low and high concentrations of these chemicals can remain in place in the environment for a significantly long period of time. Compounds such as PCE can be expected to progressively degrade (dechlorinate) over time to TCE, dichloroethenes, vinyl

chloride and ultimately to ethene and carbon dioxide. These bi-products are respectively more mobile in the subsurface.

Aromatic Hydrocarbons and Petroleum Hydrocarbon Products

Important petroleum-related compounds are noted in Table 8.1. BTEX and other non-chlorinated chemicals are characterized by relatively low K_{oc} values, moderate to high solubilities and moderate to high volatilities. Like chlorinated VOCs, these factors promote dissolved- and vapor-phase migration of the constituents in the vadose zone and the potential emission of vapors at the ground surface or formation of dissolved-phase plumes in the ground water. Non-chlorinated, petroleum-based VOCs are moderately to highly biodegradable, however, and can be expected to naturally attenuate over time, reducing the potential threat to human health and the environment. This is especially true for upward the migration of vapor-phase constituents.

8.4. Physical Conditions Affecting Migration

The Facility process and waste handling areas are almost entirely paved with asphalt or concrete which has many cracks. Surface releases of materials occurring during handling were typically contained within pits, sumps or on covered ground surfaces allowing effective cleanup. Migration of constituents entering the subsurface is constrained by the presence of shallow clay and silty clay soils. Vertical migration is further limited by the lack of infiltrating precipitation created by the paved ground surface even though many cracks noted.

8.5. Risk Characteristics of Constituents of Concern

A Conceptual Model (CM) may be developed to understand site-specific conditions at the Facility. The CM maybe considered at the RFI and CMS phases of the corrective action process. The model allows for collection of data that will be used to evaluate the impact of residual hazardous wastes/materials on the site. The model would include identification of the areas where hazardous materials/wastes were handled, potential receptors of hazardous waste constituents, and potential exposure pathways.

9.0 RECOMMENDATION - ENFORCEMENT CONFIDENTIAL

DTSC recommendation - enforcement confidential information has been removed.